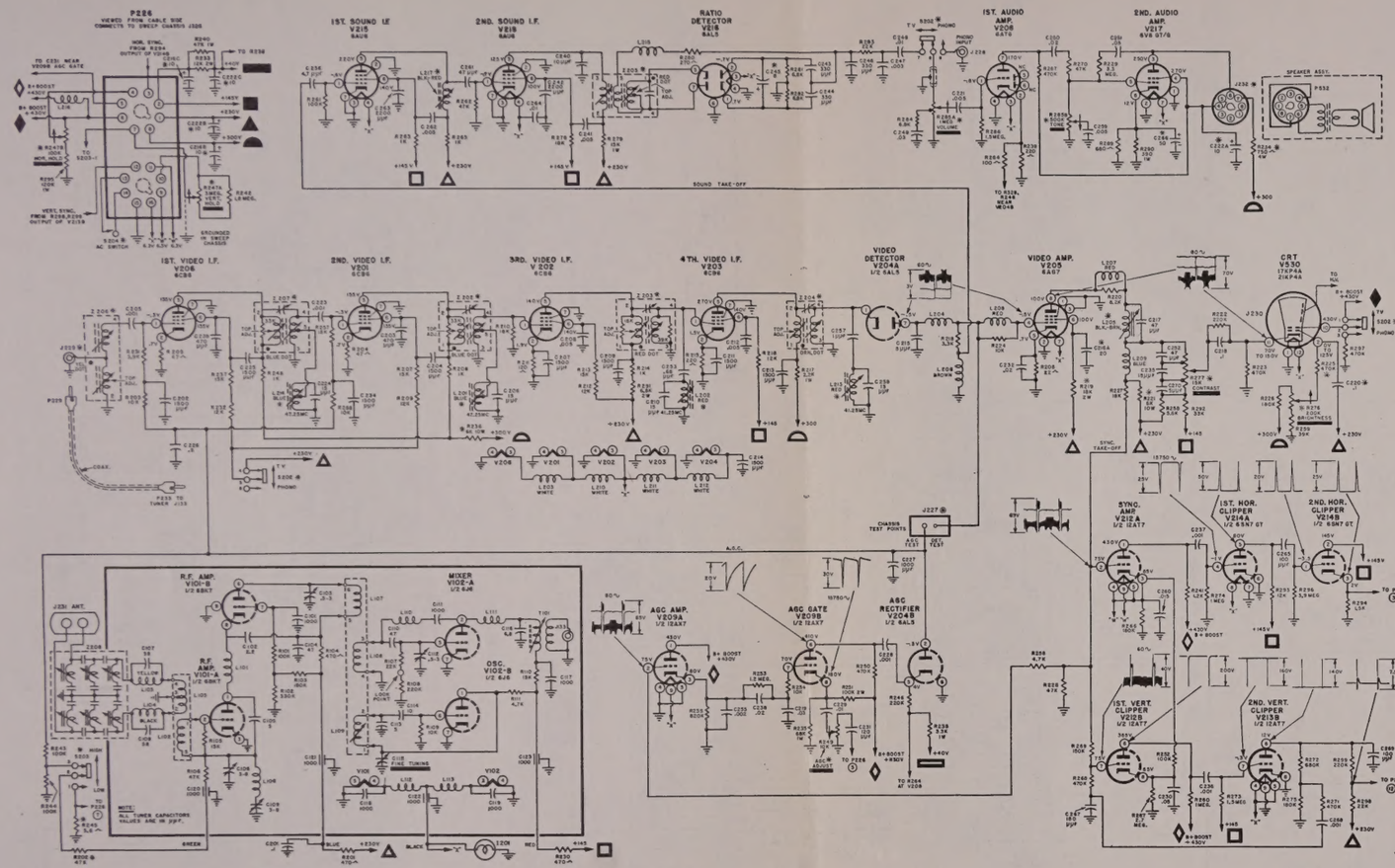
This Set Contains CUMULATIVE INDEX to PHOTOFACT Folders Sets 1 Through 170

TRADE NAME	MODEL	SET AND FOLDER No.
Ambassador	AM17C, CB, CIM, PT, TIM, AM20C, T, PL17CB, CG, PG, TM, 20C, 23P Tel. Rec.	171-2
Bell Sound	RT-65, B	171-3
Collins	75A-2	171-4
Dumont	RA-160, RA-162 Tel. Rec.	171-1A
Hallicrafters	S53A, AU	171-5
Jackson	JP-200, JP-400	171-6
Jackson	214A, 217A, B, C, 220A, B, 221A, B Tel. Rec.	171-7
Motorola	17F12, A, B, BA (Ch. TS-325, A, TS-326, A and Radio Ch. HS-319), 17K12, A, B, BA, W, WA (Ch. TS-325, A, TS-326, A), 17T7, A (Ch. TS325, A, TS-326, A), 17T8, A, B, BA (Ch. TS-325, A, TS-326, A) Tel. Rec.	171-8
Philco	52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244 Tel. Rec.	171-9
Raytheon	C-1729A, C-1731A, M-1726A, M-1728A Tel. Rec.	171-1A
Stewart-Warner	9160AU, BU, CU, DU, EU	171-10
Trav-ler	217-10, -11, -12, -14, 220-9, A, B (Ch. 33A2) Tel. Rec.	171-11
Westinghouse	H-331P4U, H-333P4U (Ch. V-2164U)	171-12



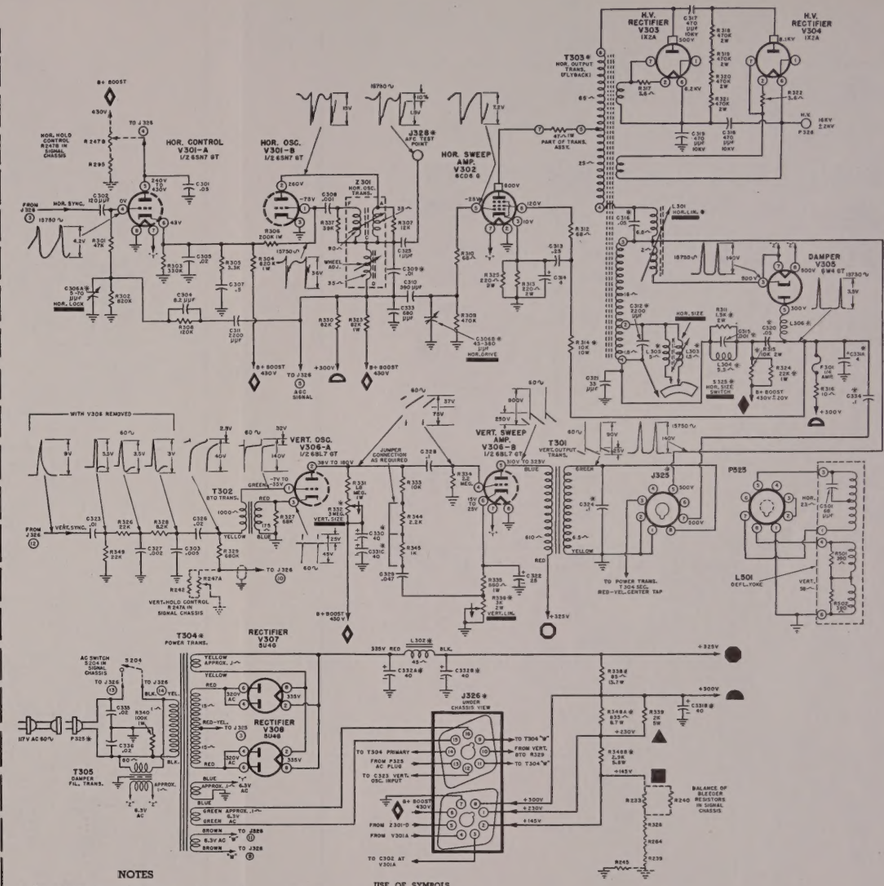
NOTES

1. All voltages were taken with V102 removed and the AGC pot (R249) rotated fully clockwise.
2. If a symbol number is followed by an asterisk the component location is shown on the under chassis drawing.
3. Only one half of V213 is used.

USE OF SYMBOLS

Solid symbol indicates source of voltage.

Open symbol indicates point to which voltage is applied.



NOTES

1. Use a high voltage probe to measure voltages at the plate of V302 and at the cathode of V305.
2. All horizontal waveforms, with the exception of that at J328, were taken with a 20 mmf capacitor in series with the oscilloscope input.
3. If a symbol number is followed by an asterisk the component location is shown on the under chassis drawing.
4. R245 is part of the bleeder network. It provides bias for the tuner input tube (see Service Manual).

USE OF SYMBOLS

Solid symbol indicates source of voltage.

Open symbol indicates point to which voltage is applied.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

DUMONT MODELS RA-160 (DEVON), RA-162 ("BANBURY, FLANDERS, WICKFORD, WIMBLEDON, WHITEHALL II")

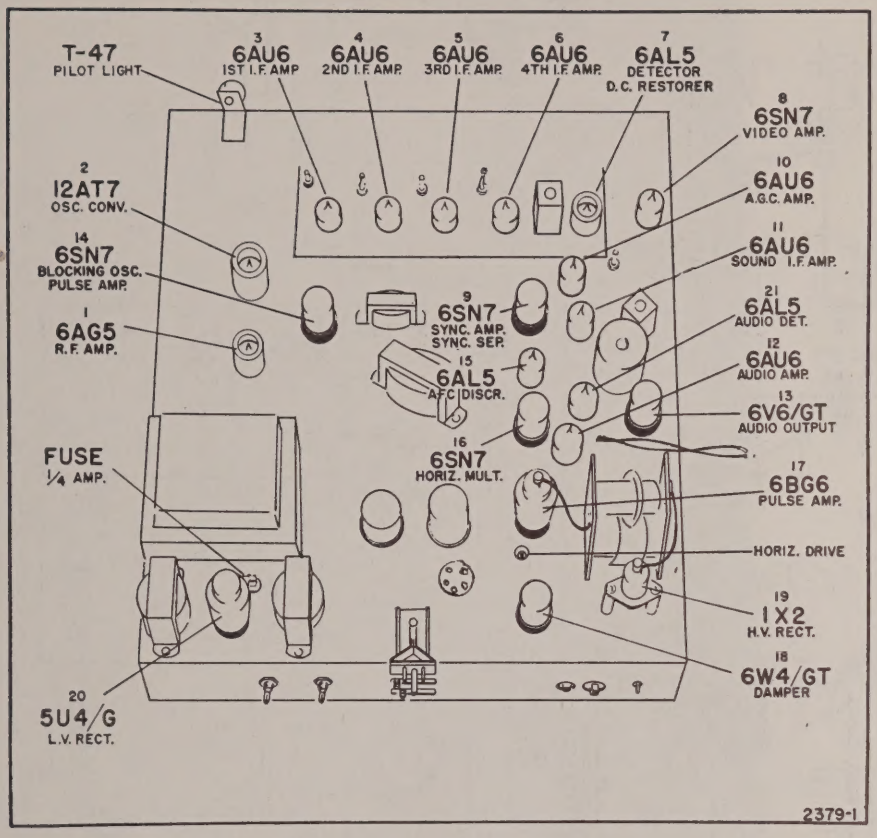
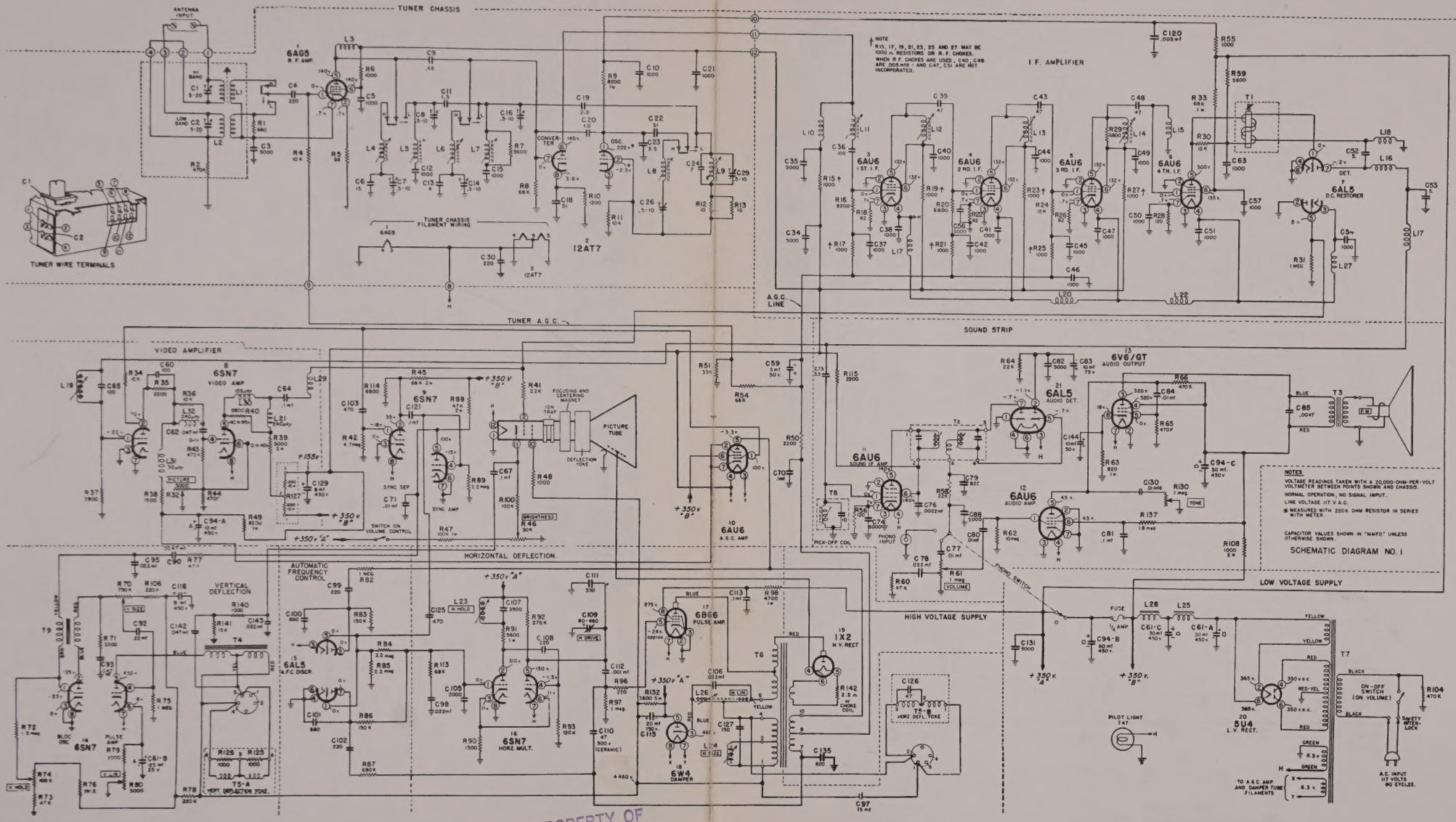


Figure 7. Tube Layout



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NOTE: A 33 ohm resistor is connected in series with pilot light (R-143).

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RAYTHEON MODELS
C-1729A, C-1731A, M-1726A, M-1728A

PRELIMINARY DATA
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PHOTOFACT* Folder

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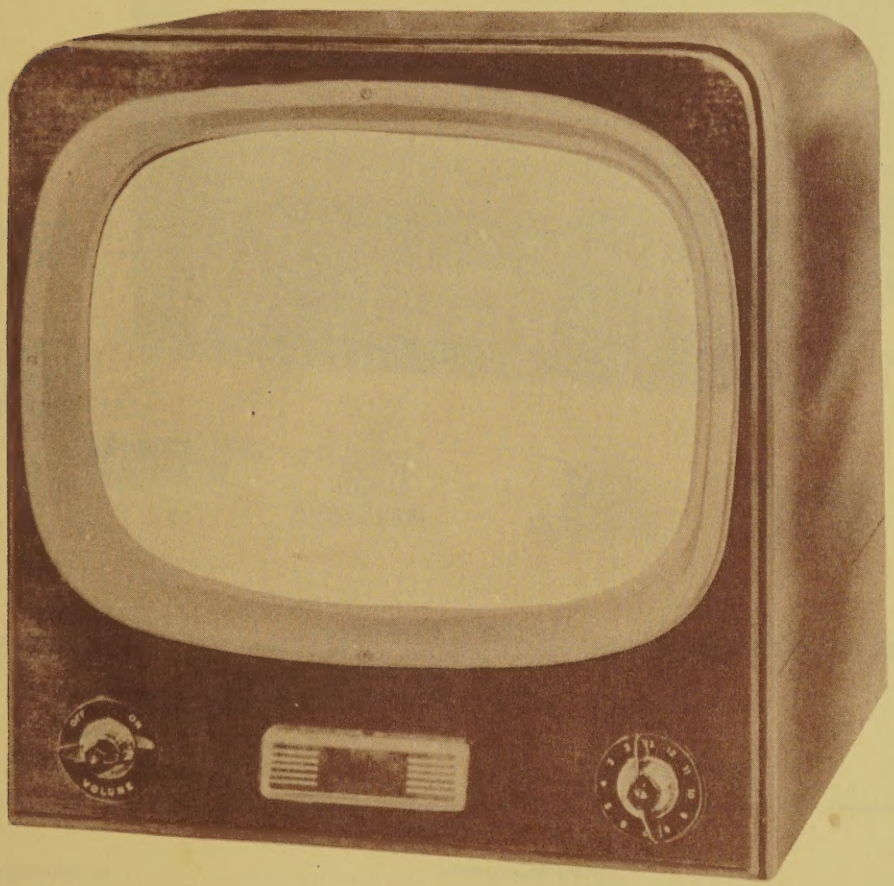

MODEL AM20T

AMBASSADOR MODELS AM17C, CB, CIM, PT, TIM, AM20C, T, PL17CB, CG, PG, TM, 20C, 23P

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DATE 6-52 SET 171 FOLDER 2

PHOTOFACT* Folder

*TRADE MARK

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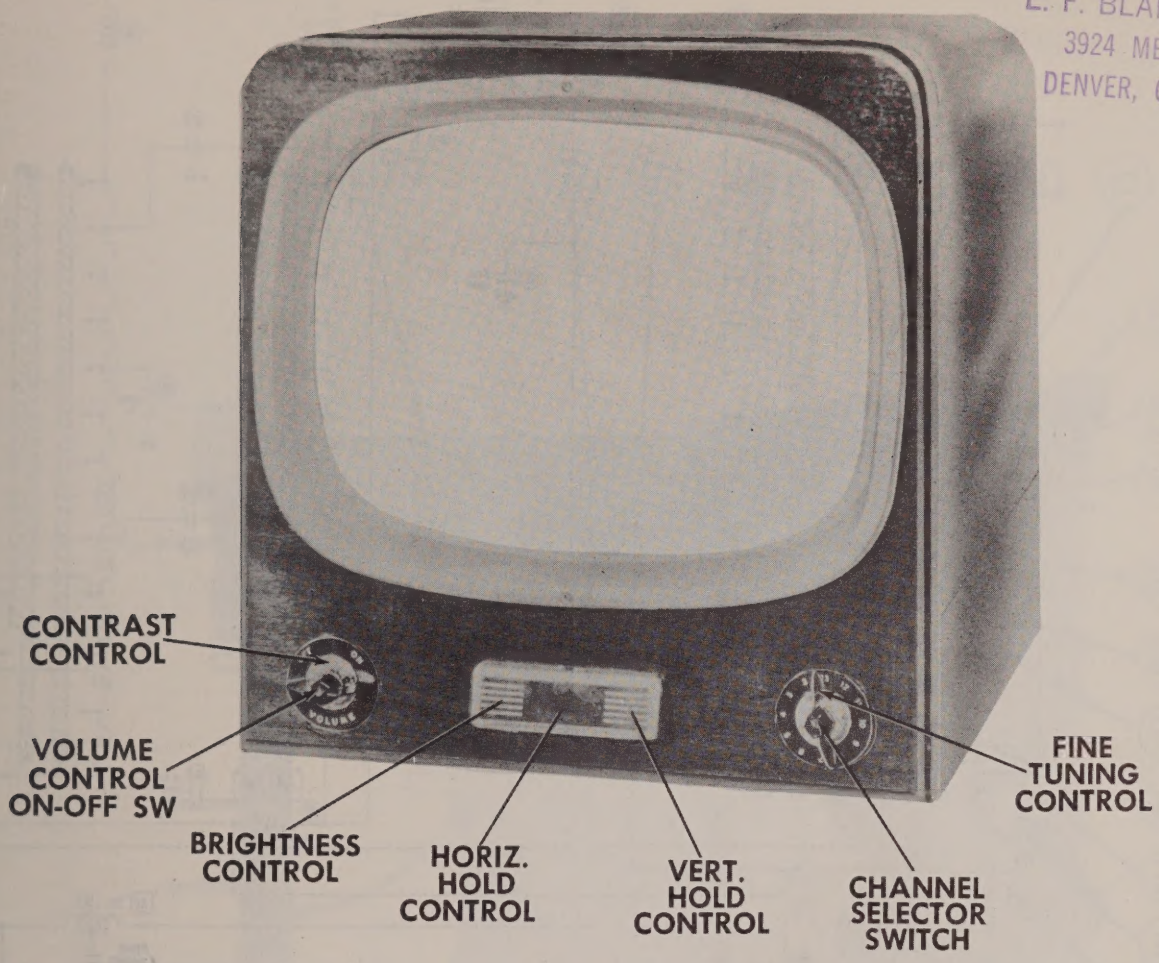

AMBASSADOR MODELS AM17C, CB, CIM, PT, TIM, AM20C, T, PL17CB, CG, PG, TM, 20C, 23P

AMBASSADOR AM20T

TRADE NAME	Ambassador Models AM17C, AM17CB, AM17CIM, AM17PT, AM17TIM, AM20C, AM20T, PL17CB, PL17CG, PL17PG, PL17TM, 20C, 23P.
SUPPLIER	Allied Pur. Corp., 401 5th. Ave., New York 16, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC - 60 Cycle
RATING	1.7 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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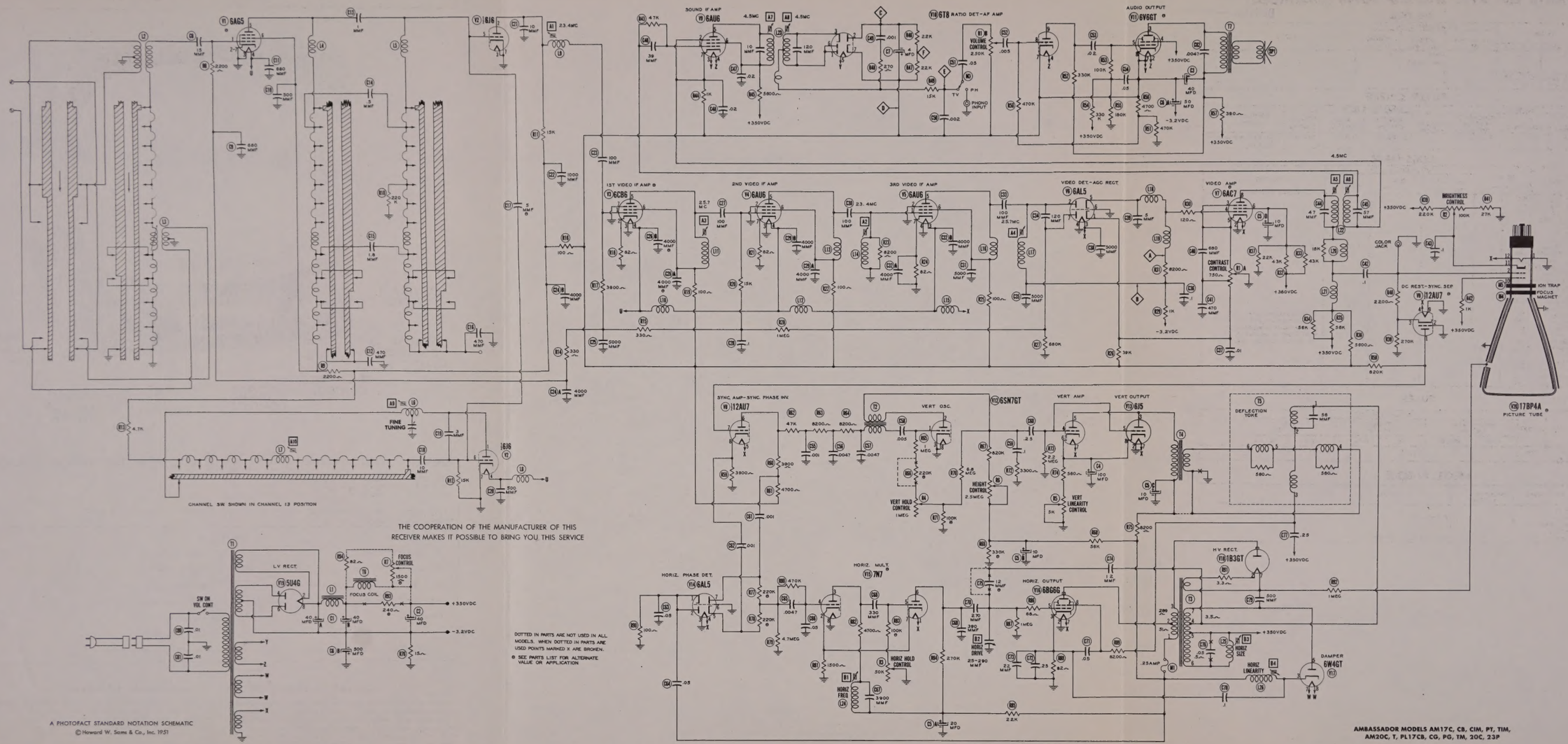
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THE COOPERATION OF THE MANUFACTURER OF THIS
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CHANNEL SW SHOWN IN CHANNEL 13 POSITION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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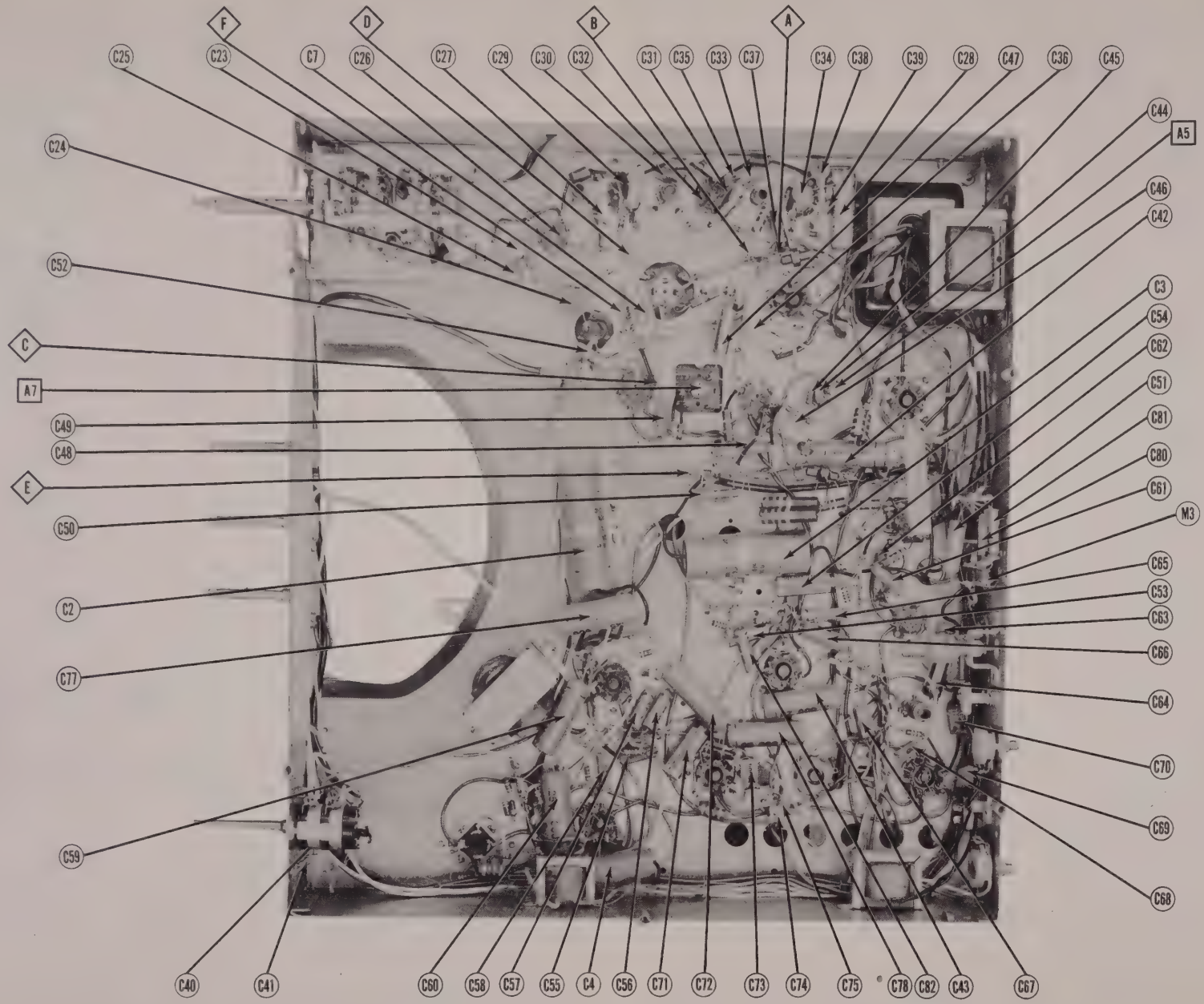
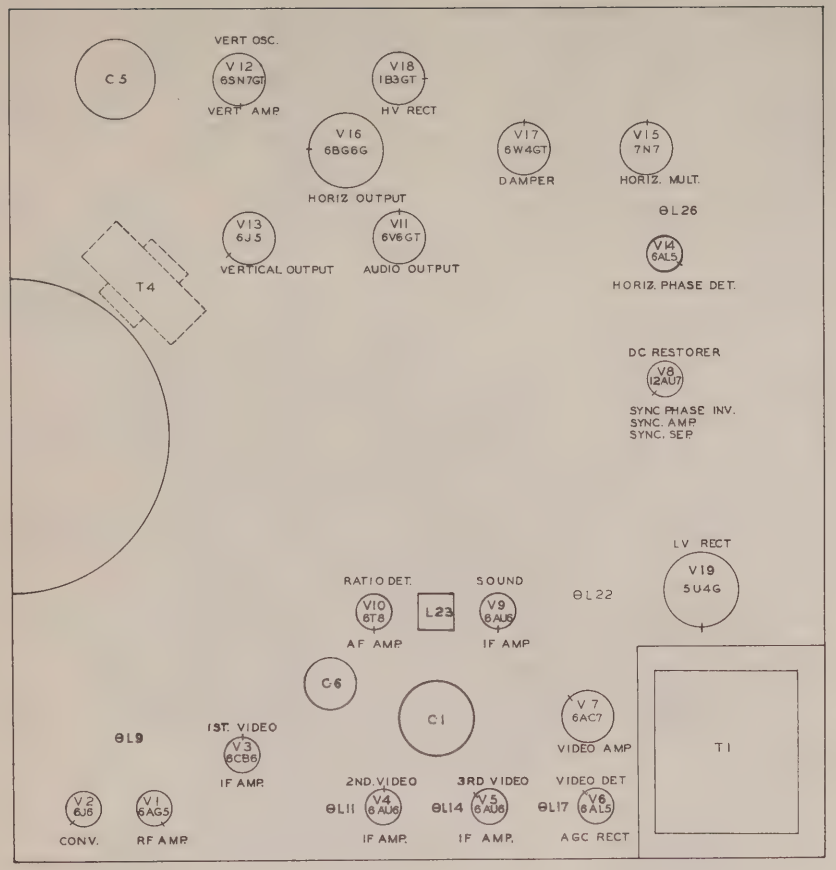
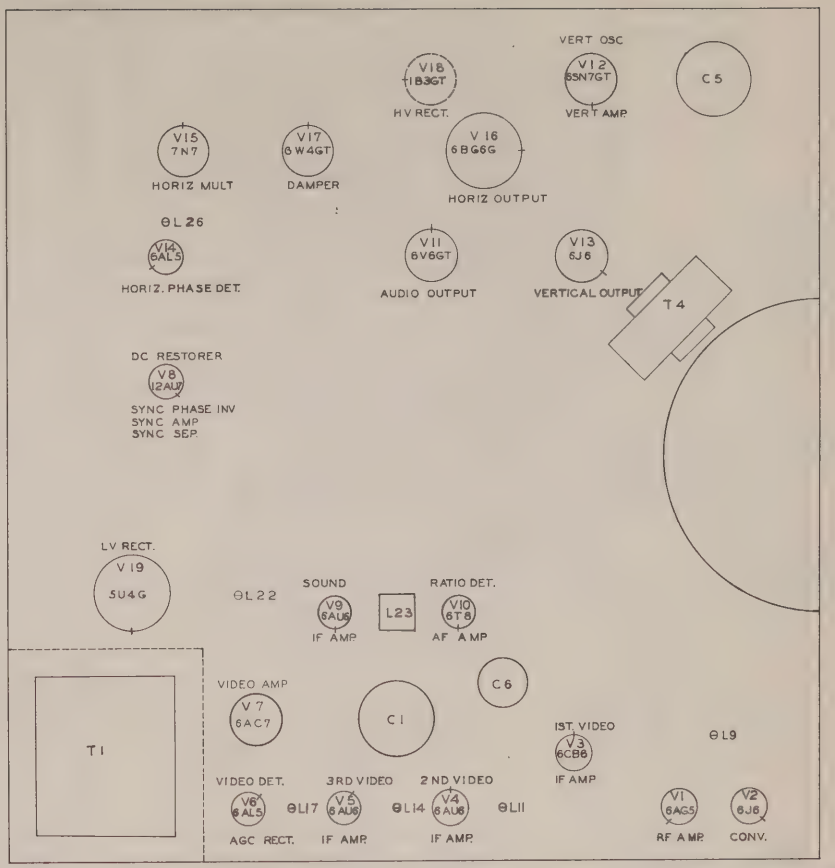
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

PROF
L T
3824 WE
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V15), from the socket.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
During video IF alignment the common lead of the VTVM is connected to approximately 2½ volts with respect to chassis. Avoid grounding the VTVM case.
Connect a short across C28.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	23.4MC (unmod.)	Any	DC probe to Point (A). Common to Point (B).	A1, A2	Adjust for maximum deflection. Attenuate signal generator to maintain 2 volt reading.
2.	"	"	25.7MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Remove the short from C28.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MC SWP)	21.6MC 26.1MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 140 volts with respect to chassis.
Avoid touching or grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD.	High side to pin 4 (Grid), of 6AC7, (V7). Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point (C). Common to Point (D).	A5, A6, A7	Adjust for maximum deflection.
5.	"	"	"	"	DC probe to Point (E). Common to Point (F).	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD.	High side to pin 4, (grid) of 6AC7, (V7). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (C). Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C7. Adjust for maximum amplitude and symmetry as per fig. 2.
5.	"	"	"	"	"	Vert. Amp. to Point (E). Low side to chassis.	A8	Reconnect capacitor C7. Adjust A8 so 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A9	Adjust to place sound marker as shown in fig. 4. The video marker should be at 50%.
7.	"	"	207MC (10MC SWP)	205.25MC 209.75MC	12	"		Check all high band channels to see that the markers can be properly placed well within the range of the fine tuning control. If not make compromise adjustment of A9.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
8.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	"	A10	Adjust to place sound marker as shown in fig. 4. The video marker should be at 50%.
9.	"	"	79MC (10MC SWP)	77.25MC 81.75MC	5	"		Check all low band channels to see that the markers can be properly placed well within the range of the fine tuning control. If not make compromise adjustment of A10.
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

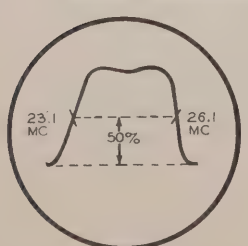


FIG. 1

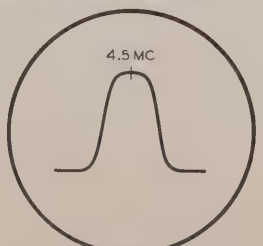


FIG. 2

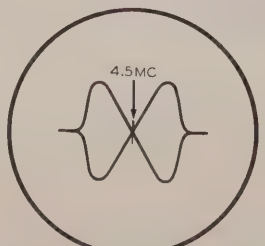


FIG. 3

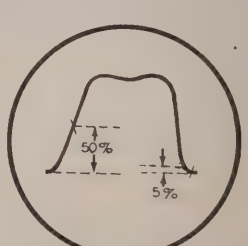
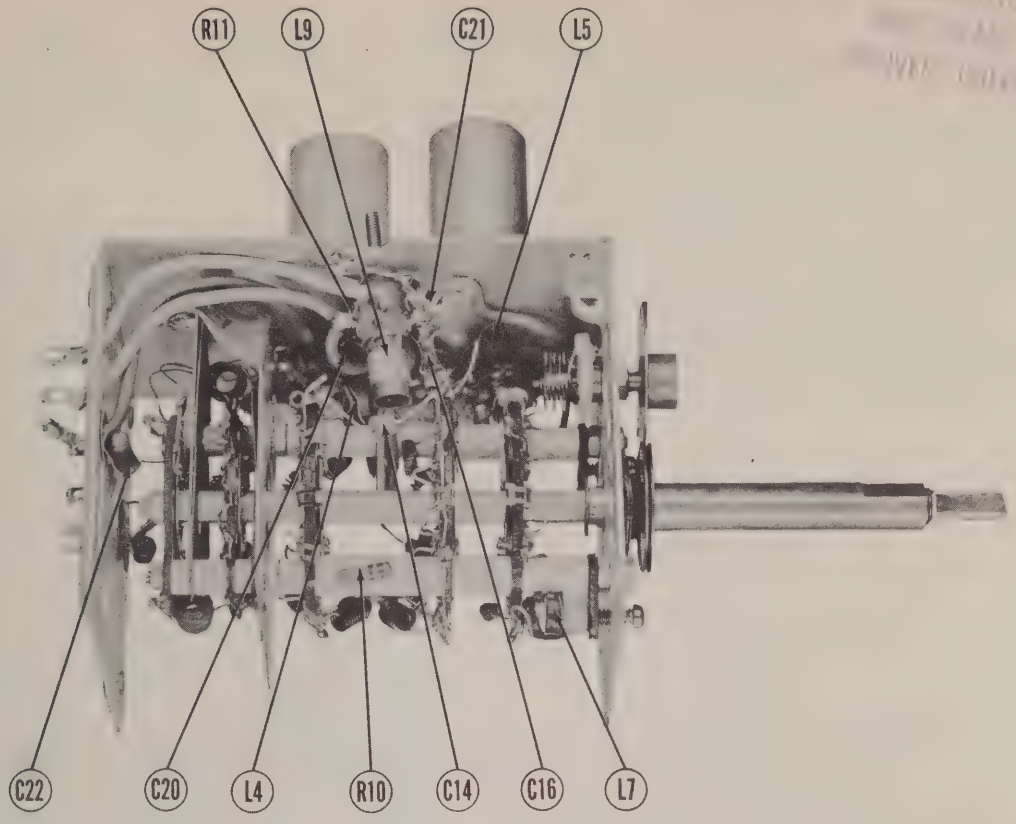
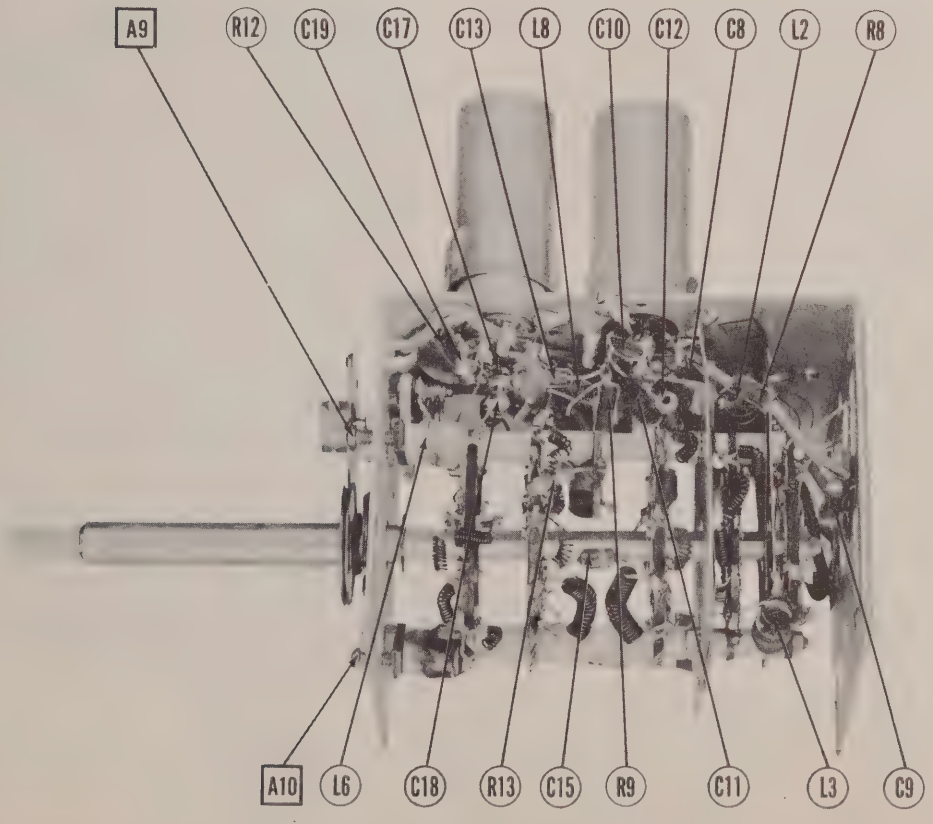


FIG. 4



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.6VDC	0V	6.3VAC	0V	105VDC	105VDC	0V		
V 2	6J6	100VDC	85VDC	0V	6.3VAC	-1.2VDC	§-3.1VDC	0V		
V 3	6CB6	-.3VDC	.9VDC	0V	6.2VAC	140VDC	140VDC	0V		
V 4	6AU6	-.3VDC	0V	0V	6.2VAC	140VDC	140VDC	.8VDC		
V 5	6AU6	0V	0V	6.2VAC	0V	140VDC	140VDC	.9VDC		
V 6	6AL5	0V	-3VDC	6.3VAC	0V	-2.4VDC	0V	- 1.2VDC		
V 7	6AC7	0V	0V	1VDC	-2.4VDC	1VDC	170VDC	6.3VAC	170VDC	
V 8	12AU7	28VDC	0V	2.5VDC	6.3VAC	6.3VAC	85VDC	28VDC	28VDC	0V
V 9	6AU6	¶8.8VDC	¶13VDC	¶0V	¶6.3VAC	¶125VDC	¶125VDC	¶13VDC		
V 10	6T8	¶-.6VDC	¶-.5VDC	¶-.6VDC	¶6.3VAC	¶0V	¶-.6VDC	¶0V	¶-.7VDC	¶185VDC
V 11	6V6GT	0V	¶6.3VAC	¶170VDC	¶205VDC	¶-8VDC	0V	¶0V	¶0V	
V 12	6SN7GT	§-60VDC §-80VDC	145VDC 290VDC	0V	§0V §-7.6VDC	380VDC	8VDC 32VDC	6.3VAC	0V	
V 13	6J5	0V	0V	390VDC	0V	0V -2.8VDC	0V	6.3VAC	8VDC 32VDC	
V 14	6AL5	0V	0V	0V	6.3VAC	8VDC	0V	-11.8VDC		
V 15	7N7	6.3VAC	12VDC	310VDC	§-2.4VDC	§-7.4VDC §-10VDC	115VDC	12VDC	0V	
V 16	6BG6G	0V	0V	7.6VDC	7.6VDC	-8.7VDC	350VDC	6.3VAC	265VDC	Top Cap *
V 17	6W4GT	0V	0V	530VDC	0V	350VDC	0V	▲6.3VAC	▲6.3VAC	
V 18	1B3GT	* DO NOT MEASURE								Top Cap *
V 19	5U4GT	0V	400VDC	0V	360VAC	0V	360VAC	350VDC	400VDC	
V 20	17BP4A	0V	2.6VDC	PIN 10 340VDC	PIN 11 30VDC 120VDC	PIN 12 6.3VAC	H. V. CONNECTOR ** 11K.V.			

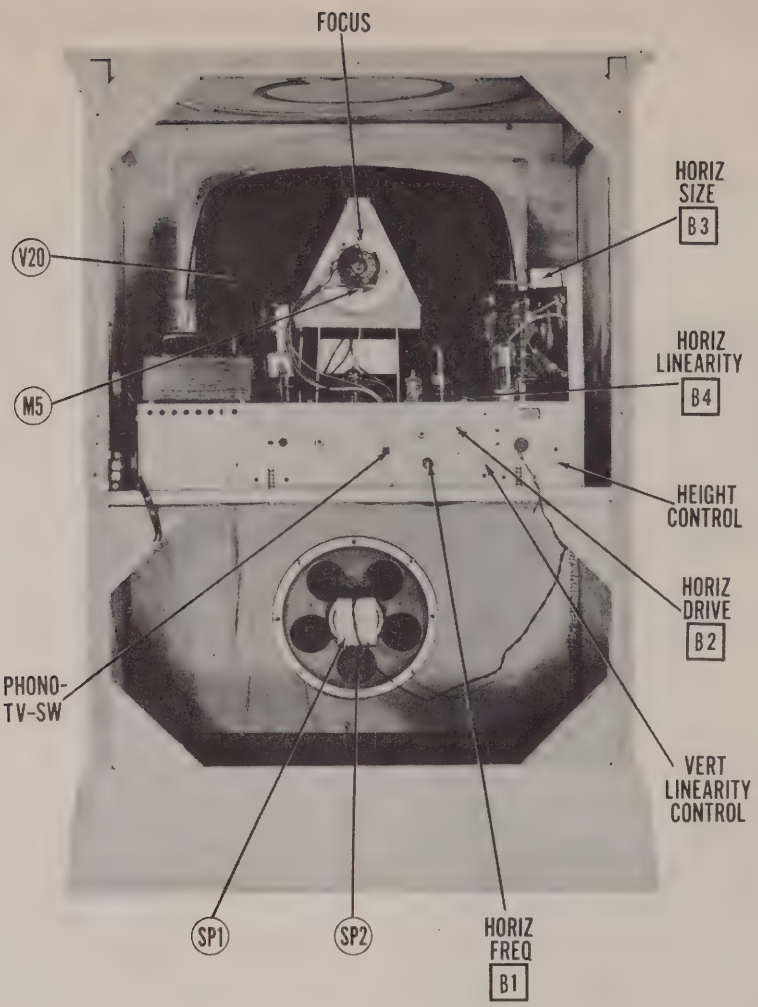
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
¶ MEASURED FROM PIN 8 OF V11
▲ MEASURED ACROSS FILAMENTS
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER
** USE EXTREME CAUTION WHEN MEASURING THIS VOLTAGE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1.6Meg	0Ω	.1Ω	0Ω	¶2.3KΩ	¶2.3KΩ	0Ω		
V 2	6J6	¶4.8KΩ	¶15KΩ	0Ω	.2Ω	220KΩ	15KΩ	0Ω		
V 3	6CB6	1.6Meg	82Ω	0Ω	.1Ω	¶100Ω	¶100Ω	0Ω		
V 4	6AU6	1.7Meg	0Ω	0Ω	.1Ω	¶100Ω	¶100Ω	82Ω		
V 5	6AU6	.2Ω	0Ω	.1Ω	0Ω	¶100Ω	¶100Ω	82Ω		
V 6	6AL5	0Ω	1KΩ	.1Ω	0Ω	9.2KΩ	0Ω	680KΩ		
V 7	6AC7	0Ω	0Ω	750Ω	9.3KΩ	750Ω	†16KΩ	.1Ω	†15KΩ	
V 8	12AU7	¶820KΩ	0Ω	270KΩ	.1Ω	.1Ω	¶8.5KΩ	¶820KΩ	3.9KΩ	0Ω
V 9	6AU6	¶47KΩ	¶1KΩ	¶0Ω	¶.1Ω	†5.8KΩ	†5.8KΩ	¶1KΩ		
V 10	6T8	¶Inf.	¶44KΩ	¶Inf.	¶.1Ω	¶0Ω	¶Inf.	¶0Ω	¶470KΩ	†330KΩ
V 11	6V6GT	Inf.	¶.1Ω	†1KΩ	†300Ω	†240KΩ	Inf.	¶0Ω	¶0Ω	
V 12	6SN7GT	2.3Meg 1.3Meg	#2Meg #800KΩ	0Ω	2.2Meg	#9.5KΩ	1.5KΩ 560KΩ	.1Ω	0Ω	
V 13	6J6	0Ω	0Ω	#9.5KΩ	Inf.	2.2Meg	Inf.	.1Ω	1.5KΩ 560Ω	
V 14	6AL5	100Ω	100Ω	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 15	7N7	.1Ω	1.5KΩ	#26KΩ	5.1Meg	150KΩ 100KΩ	#290KΩ	1.5KΩ	0Ω	
V 16	6BG6G	Inf.	0Ω	82Ω	82Ω	1Meg	†300Ω	.1Ω	†8.5KΩ	Top Cap #90Ω
V 17	6W4GT	Inf.	Inf.	180KΩ	Inf.	†300Ω	Inf.	▲.1Ω	▲.1Ω	
V 18	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								Top Cap #340Ω
V 19	5U4G	Inf.	22KΩ	Inf.	75Ω	Inf.	73Ω	†300Ω	22KΩ	
V 20	17BP4A	0Ω	270KΩ	PIN 10 †1.2KΩ	PIN 11 †100KΩ †40KΩ	PIN 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
† MEASURED FROM PIN 8 OF V19
# MEASURED FROM PIN 3 OF V17
¶ MEASURED FROM PIN 8 OF V11
▲ MEASURED ACROSS FILAMENTS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer, (B2), counter-clockwise until white beaded vertical lines appear in the raster, and then clockwise just enough to remove the lines.

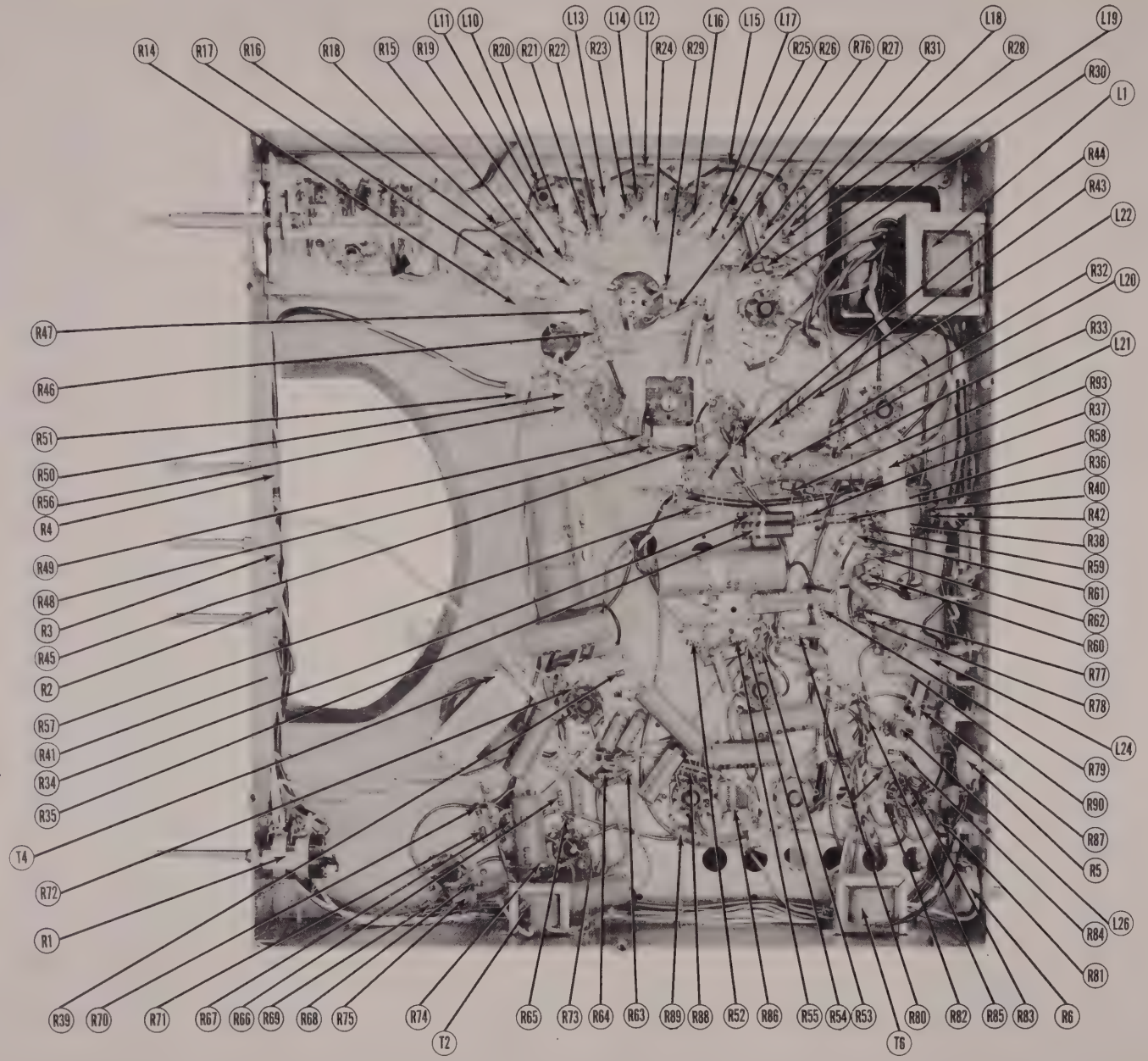
Adjust the horizontal size slug, (B3), until the picture is slightly wider than necessary to fill the mask horizontally.

Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove nine wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect speaker.
6. Remove five 5/16" hex head bolts from chassis. Remove chassis.
7. Remove four 11/32" hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier		6AG5	7BD	
B	RF Amplifier		6BC5	7BD	
V2	Converter		6J6	7BF	
V3A	1st. Video IF Amp		6CB6	7CM	
B	1st. Video IF Amp.		6BC5	7BD	
V4	2nd. Video IF Amp.		6AU6	7BK	
V5	3rd. Video IF Amp		6AU6	7BK	
V6	Video Detector - AGC Rectifier		6AL5	6BT	
V7A	Video Amplifier		6AC7	8N	
B	Video Amplifier		6AH6	7BK	
V8A	DC Restorer - Sync Separator - Sync Amplifier - Sync. Phase Inverter		12AU7	9A	
B	DC Restorer - Sync Separator - Sync. Amplifier - Sync. Phase Inverter		12AV7	9A	
C	DC Restorer - Sync Separator - Sync. Amplifier - Sync. Phase Inverter		12AZ7	8BD	
V9	Sound IF Amp.		6AU6	7BK	
V10	Ratio Detector - AF Amplifier		6T8	9E	
V11A	Audio Output		6V6GT	7AC	
B	Audio Output		6AQ5	7BZ	
C	Audio Output		6K6GT	7S	
V12	Vert. Oscillator - Vert. Amplifier		6SN7GT	8BD	
V13	Vertical Output		6J5	6Q	
V14	Horiz. Phase Det.		6AL5	6BT	
V15A	Horiz. Mult.		7N7	6AC	
B	Horiz. Mult.		6SN7GT	8BD	Used in some models.
V16	Horiz. Output		6BG6G	5BT	
V17	Damper		6W4GT	4CG	
V18	HV Rectifier		1B3GT	3C	
V19	LV Rectifier		5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: Ambassador PART No	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V20A	17BP4A	17BP4A		12D	
B	19AP4	19AP4		12D	
C	20CP4	20CP4		12D	
D	20DP4	20DP4		12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH2-57		UP4445		TVL-2764	▲ Filter
B	40	450							■ Filter
C2	40	450		PRS450/40		BR4045A		TVA-1712	Filter
C3	40	450		PRS450/40		BR4045A		TVA-1712	Audio Output Dec.
C4	300	25		PRS25/100		BRH25IA		TVA-1207	Vert. Amp. Cathode
C5A	30	450		AFH4-13		UPT2H45		TVL-4826	▲ Horiz. MV Dec.
B	10	450							▲ Vert. Osc. Dec.
C	10	450							▲ Vert. Amp. Dec.
D	10	150							Video Amp. Screen
C6A	50	150		AFH1-18		UP5015		TVL-1415	■ Decoupling
B	500	5		PRS6/500		BRH605A		TVA-1103	▲ Bias Filter
C7	4	25		PRS150/4		BR550		TVA-1263	Stabilizing Cap.
C8	15			S15	D6-150		GP1K-150	5GA-Q15	RF Coupling
C9	680			S1680	D6-681		GP2K-681	5GA-T68	AGC Filter
C10	500			[illegible]	D6-501		GP2K-501	5GA-T5	RF Amp. Dec.
C11	680			[illegible]	D6-681		GP2K-681	5GA-T68	RF Amp. Fil.
C12	470			S1470	D6-470		GP2K-471	5GA-T47	RF Amp. Plate
C13	1				TCZ-1		NP0K-010		RF Coupling
C14	.5				TCZ-.5		NP0K-R50		RF Coupling
C15	1.8						NP0K-1R8		RF Coupling
C16	470			S1470	D6-470		GP2K-471	5GA-T47	Mixer Grid Filter
C17	5			S15N P0	TCZ-4.7		NP0K-050		Osc. Coupling
C18	10			S10N P0	TCZ-10		NP0K-100	5TCC-Q1	Osc. Grid Cap.
C19	3						N333K-030		Osc. Feedback
C20	500			[illegible]	D6-501		GP2K-501	5GA-T5	Conv. Fil.
C21	10			S10N P0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C22	1000			[illegible]	DD-102		901-001	5HK-D1	RF Bypass
C23	100	500		[illegible]	D6-101	5W5T1	GP1K-101	1FM-31	IF Coupling
C24A	4000			BPD-2X004	D6-402	1D5D4	822-004	5HK-2D4	AGC Filter
B	4000				D6-402	1D5D4			RF Bypass
C25	5000			[illegible]	DD-502	1D5D5	811-005	5HK-D5	AGC Filter
C26A	4000			[illegible]	D6-402	1D5D4	822-004	5HK-2D4	1st. Video IF Dec. †
B	4000				D6-402	1D5D4			1st. Video IF Fil. †
C27	100	500		[illegible]	D6-101	5W5T1	GP1K-101	1FM-31	IF Coupling
C28	.1	300		[illegible]	DF-104	PTE4P1		2TM-P1	AGC Filter
C29A	4000			BPD-2X004	D6-402	1D5D4	822-004	5HK-2D4	2nd. Video IF Dec.
B	4000				D6-402	1D5D4			2nd. Video IF Fil.
C30	100	500		[illegible]	D6-101	5W5T1	GP1K-101	1FM-31	IF Coupling
C31	5000			[illegible]	DD-502	1D5D5	811-005	5HK-D5	3rd. Video IF Dec.
C32A	4000			BPD-2X004	D6-402	1D5D4	822-004	5HK-2D4	3rd. Video IF Cathode
B	4000				D6-402	1D5D4			3rd. Video IF Cathode
C33	100	500		[illegible]	D6-101	5W5T1	GP1K-101	1FM-31	IF Coupling
C34	1200	500		[illegible]	D6-121	5W5T15	GP2K-121	1FM-315	IF Coupling
C35	5000			[illegible]	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C36	.1	300		[illegible]	DF-104	PTE4P1		2TM-P1	Bias Filter
C37	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	RF Bypass
C38	5000			[illegible]	DD-502	1D5D5	811-005	5HK-D5	Video Det. Fil.

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C39	5	500		1469-000005	TCZ-4.7	5R5V5	NP0K-050	MS-55	Video Det. Filter
C40	680			S1680	D6-681	1W5T47	GP2K-681	5GA-T68	Contrast Contr. Shunt
C41	470			S1470	D6-471	5W5T5	GP2K-471	5GA-T47	Video Amp. Cathode
C42	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Video Coupling
C43	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Picture Tube Cathode
C44	47			S147N750	TCN-47		N750K-470	5TCU-Q47	Fixed Trimmer
C45	57				TCN-56		N570K-570		Fixed Trimmer
C46	39	500		1468-00004	D6-390	5W5Q4	GP1K-390	1FM-44	Sound IF Coupling
C47	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Sound IF Decoupling
C48	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Sound IF Cathode
C49	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	RF Bypass
C50	.002	600		P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	De-emphasis
C51	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C52	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C53	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C54	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Output Grid Dec.
C55	.001	600		P688-001	D6-103	PTE6D1	GP2L-102	6TM-D1	Vert. Integrator Net.
C56	.0047	600		P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. Integrator Net.
C57	.0047	600		P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Vert. Integrator Net.
C58	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Vert. Osc. Grid
C59	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Vert. Discharge
C60	.35	600		684-25		GP6P25		6TM-P25	Vert. Sweep Coupling
C61	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Sync. Coupling
C62	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Horiz. Sync. Coupling
C63	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	AFC Filter
C64	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Sweep Coupling
C65	.0047	600		P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	AFC Filter
C66	.05	200		P288-05	DF-503	PTE4S5		2TM-S5	Horiz. MV Grid
C67	3900	500		1464-004		LDR5D4			Fixed Trimmer
C68	330	500		1468-00035	D6-331		GP2K-331	1FM-335	Horiz. MV Feedback
C69	390	500		1468-0004	D6-391	5W5T4	GP2K-391	1FM-34	Horiz. Discharge
C70	270	500		1468-0003	D6-271	5W5T3	GP2K-271	MS-33	Horiz. Sweep Coupling
C71	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C72	.25	200		P488-25		GT2P25		2TM-P25	Horiz. Output Cathode
C73	33	500		1468-00025	D6-330	5W5Q25	GP1K-220	MS-425	Horiz. Output Cathode
C74	12	1500							Horiz. Feedback
C75	12	1500							Horiz. Feedback *
C76	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Fixed Trimmer
C77	.25	600		684-25		GP6P25		6TM-P25	Horiz. Sweep Coupling
C78	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Damper Filter
C79	500	20000		HV-20C	TV3-502				HV Filter
C80	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C81	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter
C82	.0047	600		P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Output Plate

* Not used in all models.
† Some models use 5000MMF. in this application.

CONTROLS

ITEM No.	RATING: RESIST-ANCE	RATING: WATTS	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	750Ω	2	PT-1002		RTV-252		Contrast Control - Tapped at 500Ω - Wire Wound - Front
B	250KΩ	1/2					Volume Control and SW - Rear
R2A	100KΩ	1/2	PT-1007	Q11-128	AG-49-S	AN-40	Brightness Control
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Attach to R2A per instructions
R3A	50KΩ	1/2	PT-1009	Q11-123	AG-44-S	AN-31	Horiz. Hold Control
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Attach to R3A per instructions
R4A	1Meg	1/2	PT-1008	Q11-137	AG-61-S	AN-69	Vert. Hold Control
B	Shaft		Not req.	Not req.	KSS-3	AK-4	Attach to R4A per instructions
R5A	5000Ω	1/2	PT-1004	Q11-114	AG-19-S	AN-10	Vert. Linearity Control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	2.5Meg	1/2	PT-1005	Q11-239	AG-84-S	AN-83	Height Control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7	1500Ω	4					Focus Control - Wire Wound - See Note 1

Note 1 Not used in all models.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R8	2200Ω 20%	1		BTS-2200	RF Amp. Grid
R9	2200Ω 20%	1		BTS-2200	RF Amp. Decoupling
R10	220KΩ 20%	1		BTS-220K	Mixer Grid
R11	15KΩ 20%	1		BTS-15K	Mixer Plate
R12	15KΩ 20%	1			Osc. Grid
R13	4700Ω	1		BTS-4700	Osc. Plate
R14	330Ω	1		BTS-330	AGC Network
R15	330Ω	1		BTS-330	AGC Network
R16	100Ω	1		BTS-100	Decoupling
R17	3900Ω	1		BTS-3900	1st. Video IF Amp. Grid - See Note 3
R18	82Ω	1		BTS-82	1st. Video IF Amp. Cathode
R19	100Ω	1		BTS-100	1st. Video IF Amp. Decoupling
R20	15KΩ	1			2nd. Video IF Amp. Grid
R21	82Ω	1		BTS-82	2nd. Video IF Amp. Cathode
R22	100Ω	1		BTS-100	2nd. Video IF Amp. Decoupling
R23	8200Ω	1		BTS-8200	3rd. Video IF Transformer Shunt
R24	82Ω	1		BTS-82	3rd. Video IF Amp. Cathode
R25	100Ω	1		BTS-100	3rd. Video IF Amp. Decoupling
R26	39KΩ	1		BTA-39K	Voltage Divider
R27	680KΩ	1		BTS-680K	AGC Load
R28	1Meg	1		BTS-1Meg	AGC Network
R29	1000Ω	1		BTS-1000	Bias Network
R30	120Ω	1			Parasitic Suppressor
R31	8200Ω	1		BTS-8200	Video Det. Diode Load
R32	43KΩ 5%	2			Video Amp. Screen
R33	43KΩ 5%	2			Video Amp. Screen
R34	56KΩ	2		BTB-56K	Video Amp. Plate
R35	56KΩ	2		BTB-56K	Video Amp. Plate
R36	5600Ω	1		BTA-5600	Voltage Divider
R37	22KΩ	1		BTA-22K	Voltage Divider
R38	270KΩ	1		BTS-270K	DC Restorer Diode Load
R39	220KΩ	1		BTS-220K	Voltage Divider

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R40	2200Ω	1		BTS-2200	Picture Tube Grid
R41	27KΩ 20%	1		BTS-27K	Picture Tube Cathode
R42	1000Ω	1		BTS-1000	Acc. Anode Load
R43	47KΩ 20%	1		BTS-47K	Sound IF Amp. Grid
R44	1000Ω	1		BTS-1000	Sound IF Amp. Cathode
R45	5600Ω	1		BTA-5600	Sound IF Amp. Decoupling
R46	22KΩ	1		BTS-22K	Ratio Det. Diode Load
R47	22KΩ	1		BTS-22K	Ratio Det. Diode Load
R48	270Ω 20%	1		BTS-270	Balancing
R49	15KΩ	1		BTS-15K	De-emphasis
R50	470KΩ	1		BTS-470K	AF Amp. Grid
R51	470KΩ	1		BTS-470K	AF Amp. Grid
R52	330KΩ	1		BTS-330K	AF Amp. Plate
R53	100KΩ 20%	1		BTS-100KΩ	Output Grid
R54	330KΩ 5%	1		BTS-330K-5%	Bias Network
R55	180KΩ 5%	1		BTS-180K-5%	Bias Network
R56	4700Ω 20%	1		BTS-4700	Bias Network
R57	390Ω	1		BTA-390	Decoupling
R58	820KΩ	1		BTS-820K	Sync. Sep. Plate
R59	3900Ω	1		BTS-3900	Sync. Phase Inv. Cathode
R60	3900Ω	1		BTS-3900	Sync. Phase Inv. Plate
R61	4700Ω 20%	1		BTS-4700	Sync. Phase Inv. Plate
R62	47KΩ 20%	1		BTS-47K	Integrator
R63	8200Ω	1		BTS-8200	Integrator
R64	8200Ω	1		BTS-8200	Integrator
R65	1Meg	1		BTS-1Meg	Vert. Osc. Grid
R66	220KΩ	1		BTS-220K	Vert. Osc. Grid - See Note 2
R67	820KΩ	1		BTS-820K	Vert. Osc. Plate
R68	56KΩ	1		BTS-56K	Vert. Osc. Decoupling
R69	330KΩ	1		BTB-330K	Voltage Divider - See Note 6
R70	6.8Meg	1		BTS-6.8Meg	Voltage Divider
R71	100KΩ	1		BTS-100K	Voltage Divider - See Note 6
R72	3300Ω	1		BTS-3300	Vert. Peaking
R73	2.2Meg	1		BTS-2.2Meg	Vert. Amp. Grid
R74	560Ω	1		BTS-560	Vert. Amp. Cathode
R75	8200Ω	2		BTB-8200	Vert. Amp. Decoupling
R76	15Ω	1		BW-1-15	Bias Network
R77	220KΩ	1		BTS-220K	Horiz. Phase Det. Diode Load - See Note 4
R78	220KΩ	1		BTS-220K	Horiz. Phase Det. Diode Load - See Note 4
R79	4.7Meg	1		BTS-4.7Meg	Horiz. Phase Det. Diode Load -
R80	470KΩ	1		BTS-470K	Horiz. AFC Filter
R81	1500Ω	1		BTS-1500	Horiz. MV Cathode
R82	4700Ω 20%	1		BTS-4700	Horiz. MV Plate
R83	100KΩ	1		BTS-100K	Horiz. MV Grid - See Note 6
R84	270KΩ	1		BTS-270K	Horiz. MV Plate
R85	22KΩ	1		BTA-22K	Horiz. MV Decoupling
R85	68Ω	1			Parasitic Suppressor
R87	1Meg	1		BTS-1Meg	Horiz. Output Grid
R88	82Ω	1		BW-1-82	Horiz. Output Cathode
R89	8200Ω	2		BTB-8200	Horiz. Output Screen
R90	100Ω 20%	1			Horiz. Feedback
R91	3.3Ω	1			HV Rectifier Filament - Wire Wound
R92	1Meg	1			HV Filter
R93	240Ω	15		2D-250	Filter - Wire Wound - See Note 5
R94	82Ω	2		BW-2-82	Focus Coil Shunt

Note 2 Not used in all models.
Note 3 Some models use 8200Ω resistor in this application.
Note 4 Some models use 100KΩ resistor in this application.
Note 5 Some models use 280Ω resistor in this application.
Note 6 Some models use parallel resistors in this application to obtain desired value.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ② 1.7A	720VCT .190ADC	5VAC ② 3A	6.3VAC ② 1.2A SEC. 4 6.3VAC ① 1.2A SEC. 5 6.3VAC ② 5.6A			P-3066 ②	

② 12.6V Winding used for SEC. 4 and 5.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	165Ω	900Ω		A-8114 ①	A-3000 ①	TBO-1 ①	Vert. Block Osc. Trans.
T3	340Ω Tap 51Ω	10.5Ω Taps .5Ω and 7Ω SEC. 2 0Ω		A-8130	HVO-7		Horiz. Output Trans.
T4	1.3KΩ	10Ω		A-8112	A-3036	TSO-5 ①	Vert. Output Trans.
T5A	14Ω			DY-9	MDF-70		Horiz. Deflection Coils
B	62Ω						Vert. Deflection Coils.
T6							Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Ambassador PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T7	4.4KΩ	4Ω	370Ω	.5Ω		A-3877	A-2930	RO-9 ①	① Drill one new mounting hole.

PARTS LIST CONTINUED ON PAGE 15

PROPERTY OF C. F. BLA[illegible]

L. F. BL... DENVER, COLO...

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Ambassador PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	4Ω		ST115 Model P8-V	8A31	
	CONE DIA.	V. C. DIA.				
SP2	7 3/4"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	Ambassador PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.190A	69Ω	3.5Henries		C-2325 ①	C-2974	TR4200①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Ambassador PART No.	MERIT PART No.	IRC PART No.	
L2	Ant. Coil	0Ω	0Ω				
L3	Ant. Coil	0Ω	0Ω				
L4	RF Coil	0Ω					
L5	Mixer Grid Coil	0Ω					
L6	Osc. Coil	0Ω					
L7	Osc. Coil	0Ω					
L8	Fil. Choke	.2Ω				CLA	.47 Microhenries
L9	1st. Video IF	.5Ω					
L10	Fil. Choke	0Ω					
L11	2nd. Video IF	.4Ω					
L12	Fil. Choke	0Ω					
L13	RF Choke	2.6Ω					
L14	3rd. Video IF	.2Ω					
L15	Fil. Choke	0Ω					
L16	RF Choke	2.8Ω					
L17	4th. Video IF	.4Ω					
L18	Peaking	8Ω					120 Microhenries (yellow dot)
L19	Peaking	18Ω					600 Microhenries (red dot)
L20	Peaking	12Ω					240 Microhenries wound on 18KΩ Resistor (Green Dot)
L21	Peaking	15Ω					380 Microhenries (blue dot)
L22	Sound IF	1.7Ω	1.4Ω				
L23	Ratio Det. Trans.	6.8Ω	.2Ω				Tap .5Ω
L24	Horiz. Osc.	55Ω					
L25	Horiz. Size	.7Ω					
L26	Horiz. Lin.	38Ω					

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						
			AMBASSADOR PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	.250A			318.250		GJV1/4		

MISCELLANEOUS

ITEM No.	PART NAME	Ambassador PART No.	NOTES
M2	RF Tuner		
M3	Switch		(TV-Phono)
M4	Focus Magnet		
M5	Ion Trap		
B2	Trimmer		Horiz. Drive 25-290 MMF.

PROPERTY
L. F. BLANK
3924 MEADE ST.
DENVER, COLORADO

BELL SOUND
MODELS RT-65, B

BELL SOUND
MODELS RT-65, B

TRADE NAME	Bell Sound Models RT-65, RT-65B
MANUFACTURER	Bell Sound Systems Inc., 555 Marion Rd., Columbus, Ohio
TYPE SET	AC Operated Tape Recorder & Playback Amplifier
TUBES (FOUR)	Types 12AX7 Pre-Amp. - 1st. AF Amp., 12AU7 2nd. AF Amp. - Bias Osc., 6V6GT Output, 6X5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .375 Amp. @ 117 volts AC

FOR SERVICE INFORMATION ON MECHANICAL UNIT- SEE SIMILAR EICOR 1000 MODEL - PHOTOFACT SET 90 - FOLDER 4 OR RECORD CHANGER MANUAL CM-3

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		BELL SOUND PART No.	STANDARD REPLACEMENT		
V1	Pre Amp-1st. AF Amp.	12AX7	12AX7	9A	
V2	2nd. AF Amp.-Bias Oscillator	12AU7	12AU7	9A	
V3	Audio Output	6V6GT	6V6GT	7AC	
V4	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

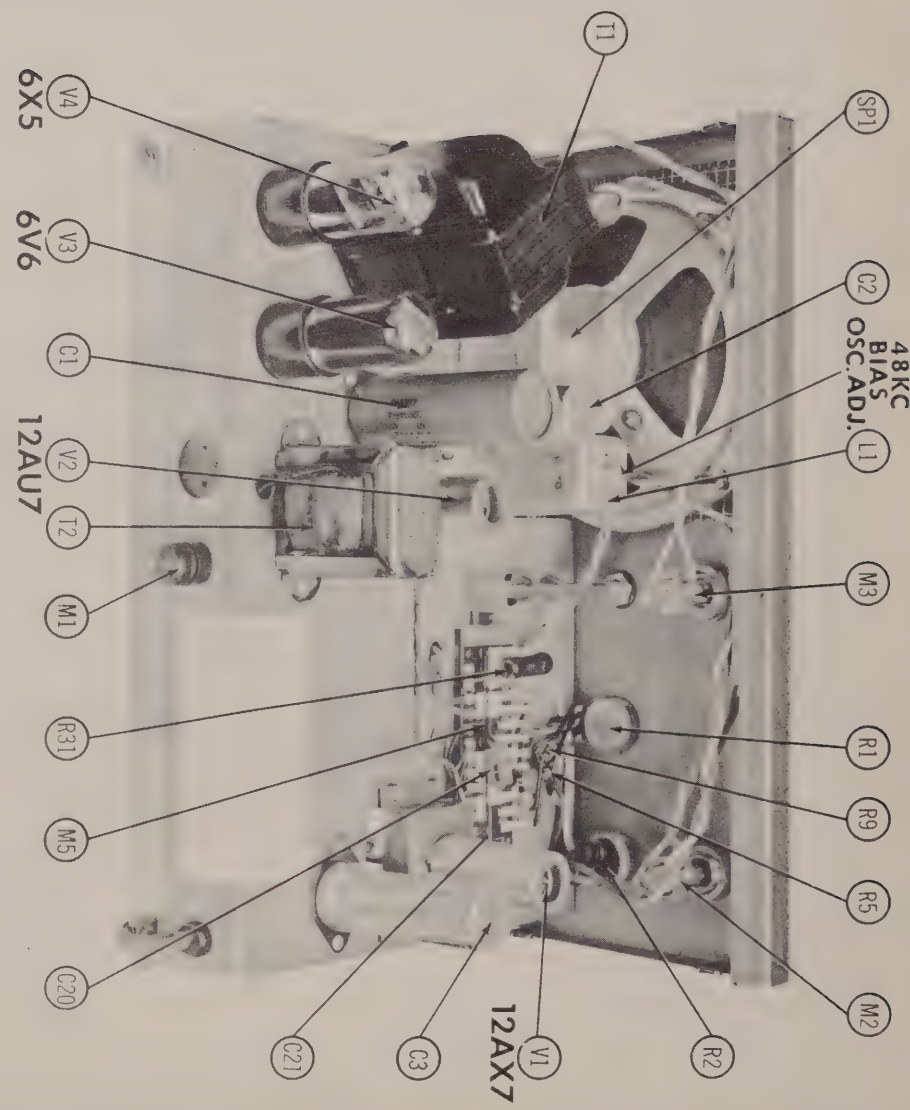
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	BELL SOUND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	40	450		AFH1-52		UPT4045		TVL-1725	Filter
C2A	20	450		AFH3-129		UP2245C		TVL-3739	▲ Filter
B	20	450							■ Filter
C	20	25							Audio Output Cathode
C3A	20	450		AFH3-129		UP2245C		TVL-3739	■ Decoupling
B	20	450							▲ Decoupling
C	20	25							1st. AF Amp. Cathode
C4	.047	200		P288-05	DF-503	PJZS5		2TM-S5	Audio Coupling
C5	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	Audio Coupling
C6	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C7	.002	600		P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Coupling
C8	.002	600		P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Coupling
C9	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	Tone Comp.
C10	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C11	470	500		1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Tone Comp.
C12	.015	600		P688-015		PTE6S15		6TM-S15	2nd. AF Amp. Grid
C13	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C14	.002	600		P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Output Plate
C15	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Indicator Coupling
C16	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	RF Bypass
C17	10000	500						MS-11	Fixed Trimmer
C18	10000	500						MS-11	Fixed Trimmer
C19	.0047	400		P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Bias Osc. Grid Cap.
C20	200	500		1468-0002	D6-201	5W5T2	GP2K-201	1FM-32	Fixed Trimmer
C21	470	500		1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Tone Comp.
C22	.05	600		P688-05		PTE6S5		6TM-S5	Line Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	BELL SOUND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	B20066P97	Q13-133	AG-60-Z	B-60	Volume Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A per instructions
R2A	500KΩ	½	B20066P96	Q13-133	AG-60-Z	B-60-S	Tone Control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R2A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R2A per instructions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	BELL SOUND PART No.	IRC PART No.	
R3	10Meg	½		BTS-10Meg	Pre Amp. Grid
R4	470KΩ	½		BTS-470K	Pre Amp. Plate
R5	100KΩ	½		BTS-100K	Tone Compensation
R6	3300Ω	½		BTS-3300	1st. AF Amp. Cathode
R7	270KΩ	½		BTS-270K	1st.AF Amp. Plate
R8	100KΩ	½		BTS-100K	Decoupling
R9	82KΩ	½		BTS-82K	Voltage Divider
R10	22KΩ	½		BTS-22K	2nd.AF Amp. Grid
R11	130KΩ	½			2nd. AF Amp. Grid
R12	2700Ω	½		BTS-2700	2nd. AF Amp. Cathode
R13	270KΩ	½		BTS-270K	2nd.AF Amp. Plate
R14	130KΩ	½			Tone Compensation
R15	100KΩ	½		BTS-100K	Bias Osc. Cathode
R16	39KΩ	½		BTS-39K	Bias Osc. Grid
R17	10KΩ	2		BTB-10K	Bias Osc. Plate
R18	360Ω	1			Output Cathode
R19	270KΩ	½		BTS-270K	Output Grid
R20	100KΩ	½		BTS-100K	Tone Compensation
R21	270KΩ	½		BTS-270K	Voltage Divider
R22	4700Ω	½		BTS-4700	Isolation
R23	470Ω	½		BTS-470	Monitor Shunt
R24	150KΩ	½		BTS-150K	Feedback Network
R25	27KΩ	½		BTS-27K	Feedback Network
R26	2.2Meg	½		BTS-2.2Meg	Volume Indicator Shunt
R27	6800Ω	1		BTA-6800	Filter
R28	4700Ω	1		BTA-4700	Filter
R29	150Ω	½		BTS-150	Filament Shunt
R30	150Ω	½		BTS-150	Filament Shunt
R31	3Ω	5		1 3/4A-3	Feedback Network - Wire Wound

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	BELL SOUND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ⓐ.370A	640VCT .047ADC	6.3VAC 1.8A		B20203	PC8407	P-3150 ①	PV-50 ①

① Drill new Mtg. Holes

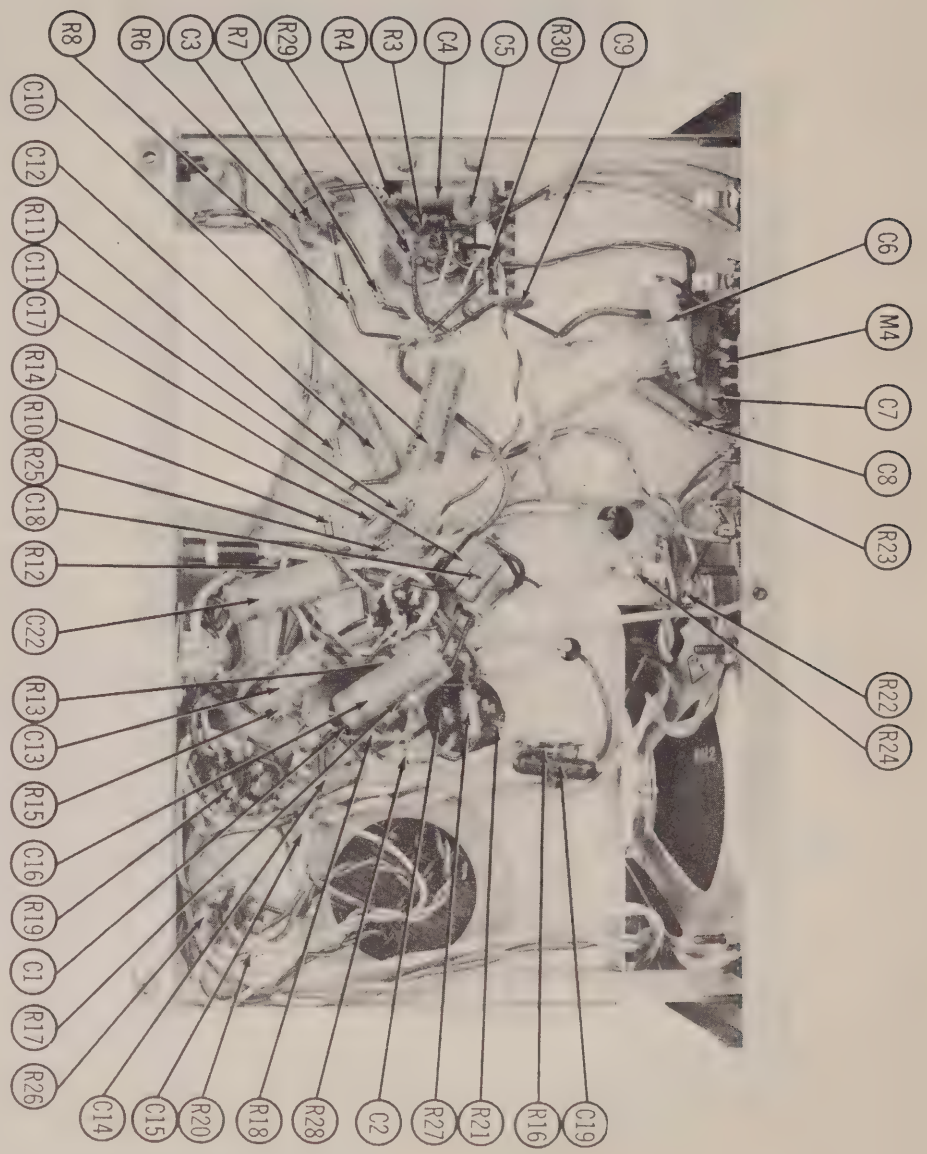
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		BELL SOUND PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	8KΩ	6.4Ω CT	700Ω	7ΩCT	B20204	A-3849 ②			② Drill One New Mtg. Hole

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	BELL SOUND PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P.M.	3.2Ω	B20111P17	ST-108 Mod. P6-X	6A15	
	CONE DIA.	V. C. DIA.				
SP1B	6"	9/16"				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	BELL SOUND PART No.	MERIT PART No.	
L1	Bias Osc.	9.7Ω	4.6Ω	B-13793		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			BELL SOUND PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Slo-Blo	2A. 125V.			313002	342001	MDL2	HKP

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					BELL SOUND PART No.		
M2	Bayonet	6-8	.15	Brown			Type #47

MISCELLANEOUS

ITEM No.	PART NAME	BELL SOUND PART No.	NOTES
M3	Neon Bulb		NE-51 (Level Indicator)
M4	Switch	A-13055	Speed Equalizer
M5	Switch	B-13053P4	Function Selector
	Recording Head	B-13828	Shure Type TR-5

BIAS-ERASE OSCILLATOR ADJUSTMENT

The bias-erase oscillator normally will not require adjustment except in the event of replacement of the oscillator coil or associated circuit components.
Connect the horizontal amplifier of an oscilloscope through a 47KΩ Resistor to pin 1 (plate) of 12AU7 (V2). Connect the low side of scope to chassis.
Set the horizontal sweep switch to external.
Connect the output of a signal generator with a range including 24KC, to the vertical amplifier of the scope.
Turn the tape recorder on and set the record playback switch to record position.
Adjust the vertical and horizontal attenuators of the scope for a trace of convenient size.
With the signal generator set at 24KC adjust the slug of the oscillator coil, setting it at 48KC as indicated by the 2 to 1 Lissajon figure shown in Fig. 1.

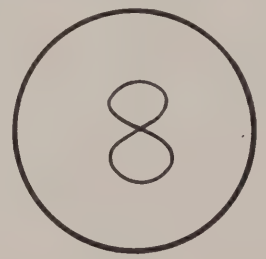
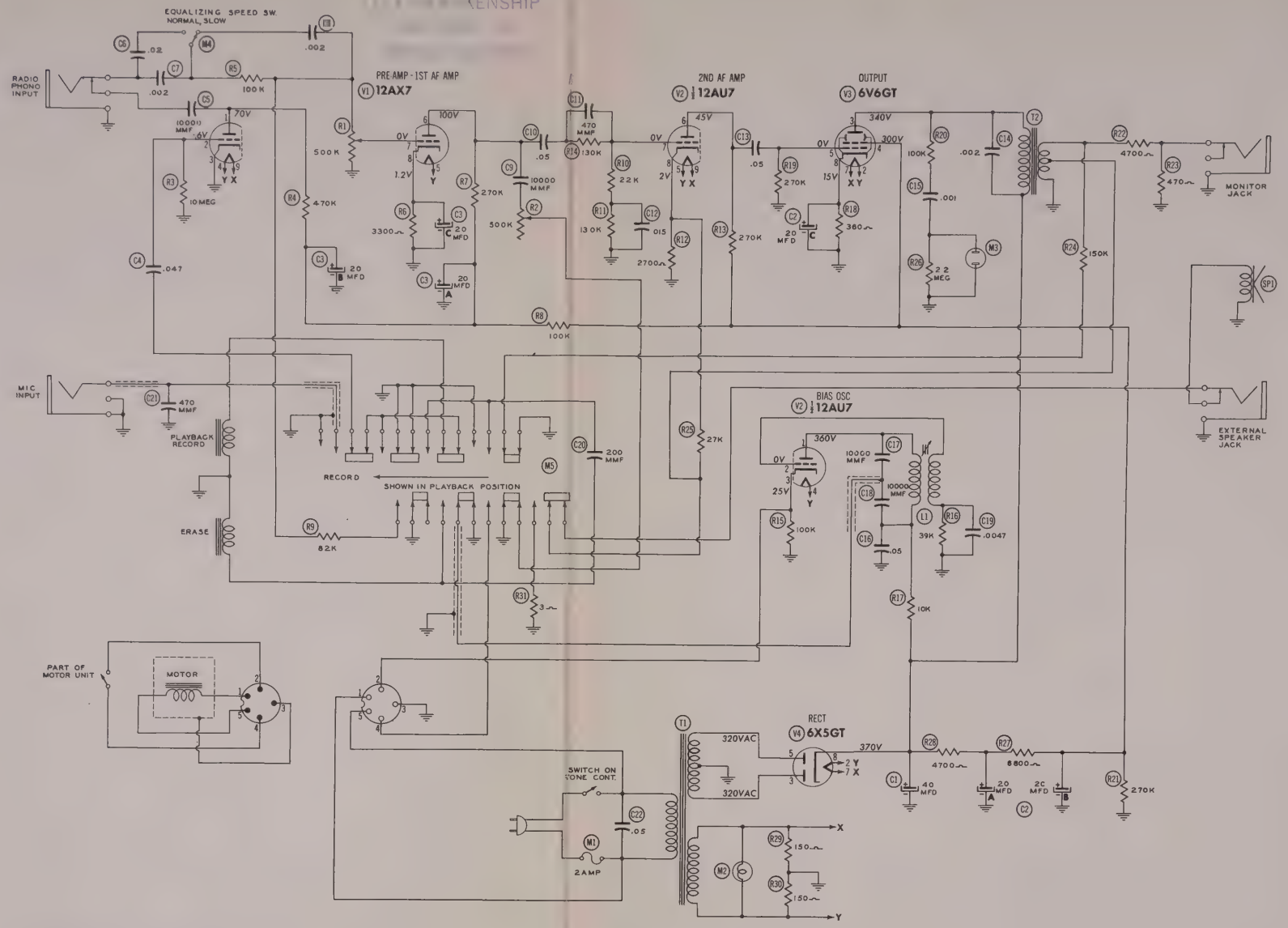


FIG. 1

An indication of the direction and extent of adjustment necessary may be had by slowly turning the signal generator on either side of 24KC until the 2 to 1 curve is obtained and noting whether the frequency was increased or decreased. If the generator frequency was increased the indication is that the oscillator is set at too high a frequency and the slug must be turned clockwise.



1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†580KΩ	1Meg	0Ω	¶0Ω	¶0Ω	†380KΩ	0Ω	3.3KΩ	¶.1Ω
V 2	12AU7	†10KΩ	39KΩ	100KΩ	¶0Ω	¶0Ω	†250KΩ	150KΩ	2.7KΩ	¶.1Ω
V 3	6V6GT	0Ω	¶0Ω	†700Ω	†1KΩ	270KΩ	INF	¶.1Ω	380Ω	
V 4	6X5GT	0Ω	10Ω	310Ω	2.2Meg	300Ω	2.2Meg	¶.1Ω	60KΩ	

ALL MEASUREMENTS TAKEN IN "PLAYBACK" POSITION
† MEASURED FROM PIN 8 OF V4
¶ MEASURED FROM PIN 2 OF 4

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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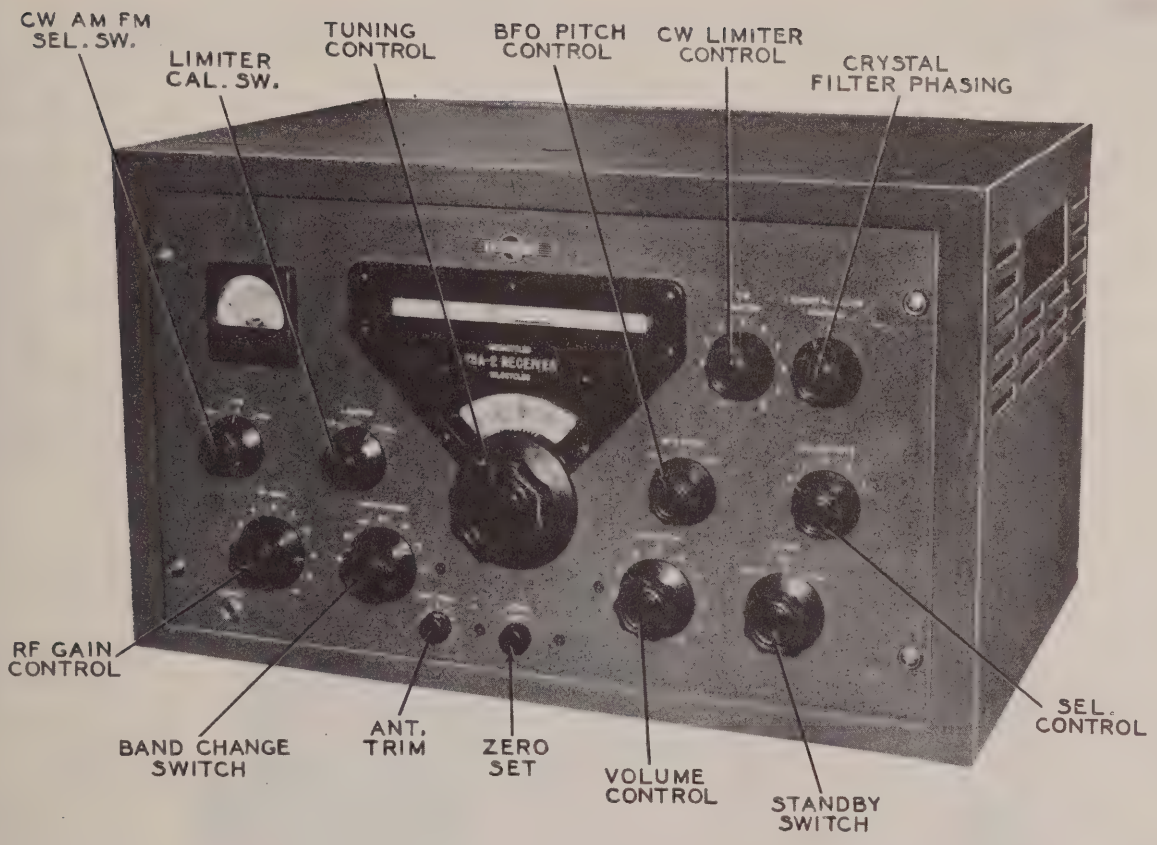
THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE



COLLINS
MODEL 75A-2

COLLINS
MODEL 75A-2

TRADE NAME	Collins Model 75A-2	
MANUFACTURER	Collins Radio Co., Cedar Rapids, Iowa	
TYPE SET	AC Operated Multi-band Superheterodyne Communications Receiver	
TUBES	Seventeen	
POWER SUPPLY	110-120 Volts AC - 60 Cycle	
RATING	.840 Amp @ 117 Volts AC	
FREQ. RANGES	BAND	FREQ.
	160 Meters	1.5 - 2.5 MC
	80 Meters	3.2 - 4.2 MC
	40 Meters	6.8 - 7.8 MC
	20 Meters	14.0 - 15.0 MC
	15 Meters	20.8 - 21.8 MC
	11 Meters	26.0 - 28.0 MC
	10 Meters	28.0 - 30.0 MC

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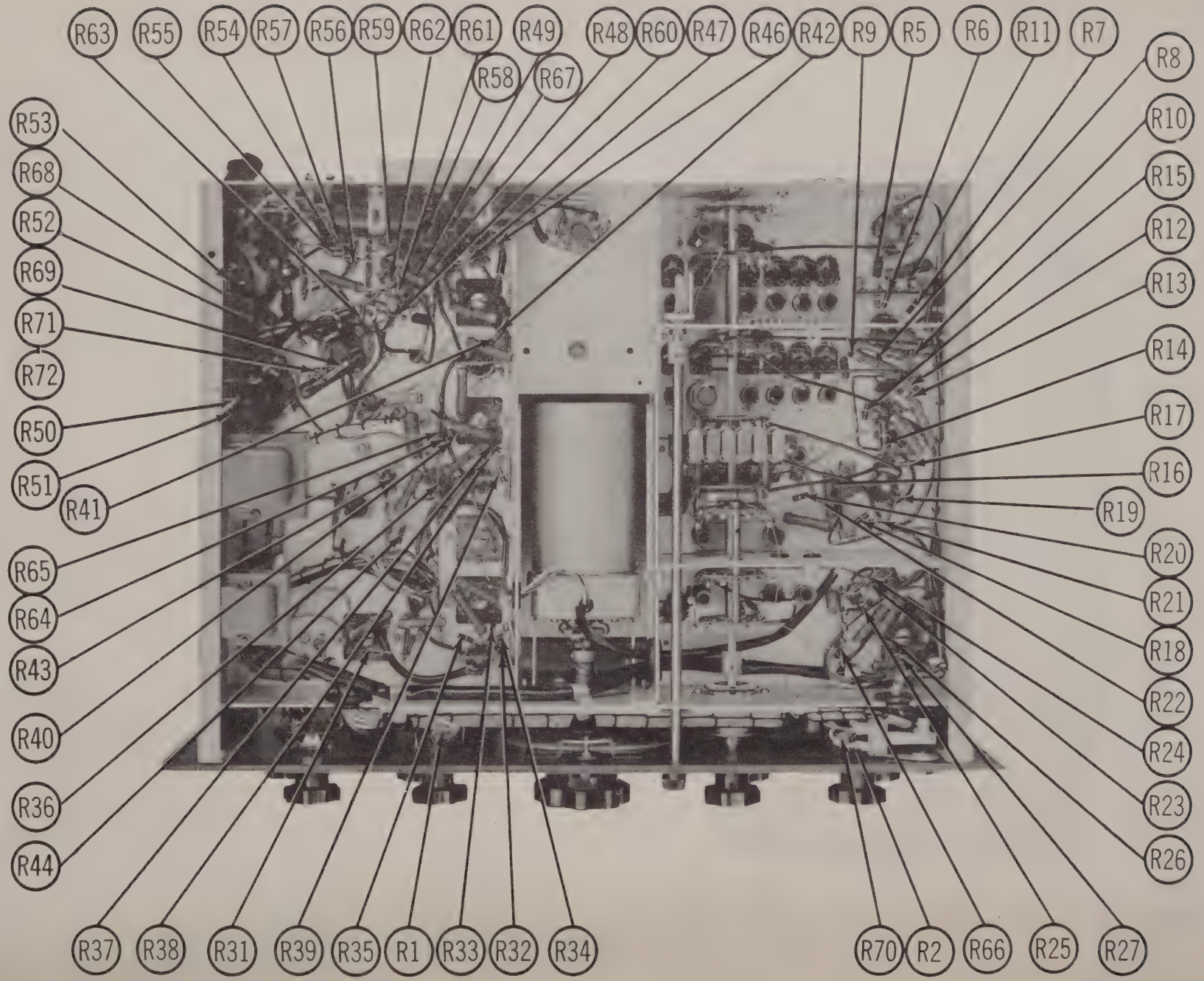
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R39
R35
R1
R33
R32
R34
R70
R2
R66
R25
R27

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: COLLINS PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	257 0040 00	6AK5	7BD	
V2	1st. Mixer	257 0048 00	6BE6	7CH	
V3	Crystal Osc.	255 0205 00	12AT7	9A	
V4	2nd. Mixer	257 0048 00	6BE6	7CH	
V5	VF Oscillator	255 0185 00	6BA6	7BK	
V6	Buffer	255 0185 00	6BA6	7BK	
V7	1st. IF Amplifier	255 0185 00	6BA6	7BK	
V8	2nd. IF Amplifier	255 0185 00	6BA6	7BK	
V9	3rd. IF Amplifier	255 0185 00	6BA6	7BK	
V10	Detector-AVC Rectifier	257 0018 00	6AL5	6BT	
V11	BFO	255 0185 00	6BA6	7BK	
V12	AVC Amplifier-AF Amplifier	255 0201 00	12AX7	9A	
V13	Noise Limiter	257 0018 00	6AL5	6BT	
V14	C-W Noise Limiter	257 0018 00	6AL5	6BT	
V15	Audio Output	255 0195 00	6AQ5	7BZ	
V16	Volt. Regulator	257 0252 00	0A2	5BO	
V17	Rectifier	255 0157 00	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: COLLINS PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	183100900	AFH2-57		UPT4445		TVL-2764	▪ Filter
B	40	450							■ Filter
C2	50	150	183104500	PRS150/50		BR5015A		TVA-1414	Bias Filter
C3	20	150	183104200	PRS150/20		BR2015A		TVA-1410	AVC Amp. Cathode
C4	390	500	912053500						Fixed Trimmer
C5	650	500	912054800						Fixed Trimmer
C6	270	500	912052400						Fixed Trimmer
C7	120	500	912050100						Fixed Trimmer
C8	68	500	912048300	1469-00007		5R5Q7		MS-47	Fixed Trimmer
C9	100	600	912049500	1468-0001	D6-101	5W5T1		1FM-31	RF Coupling
C10	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	AVC Filter
C11	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	RF Amp. Screen Bypass
C12	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	RF Amp. Cathode Bypass
C13	650	500	912054800						Fixed Trimmer
C14	270	500	912052400						Fixed Trimmer
C15	120	500	912050100						Fixed Trimmer
C16	68	500	912048300	1469-00007		5R5Q7		MS-47	Fixed Trimmer
C17	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	RF Amp. Plate Dec.
C18	10	500	912043200	1468-00001	D6-100	5W5Q1	GP1K-100	MS-41	RF Coupling
C19	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	1st. Mixer Screen
C20	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	1st. Mixer Cathode
C21	100	500	912049500	1469-0001		5R5T1		MS-31	Osc. Coupling
C22	220	500	912051900						Osc. Grid Cap.
C23	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	Osc. Plate Bypass
C24	220		912051900						Fixed Trimmer
C25	120	500	912050100						Fixed Trimmer
C26	120	500	912050100						Fixed Trimmer
C27	100	500	912049500	1469-0001		5R5T1		MS-31	Fixed Trimmer
C28	47	500	912047100	1469-00005		5R5Q5		MS-45	Fixed Trimmer
C29	39	500	912046500	1469-00004		5R5Q4		MS-44	Fixed Trimmer
C30	56	500							Fixed Trimmer †
C31	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	1st. Mixer Plate Dec.
C32	330	500	912053000						Fixed Trimmer
C33	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	RF Coupling
C34	4		916438100				NP0K-040		IF Coupling
C35	1		916436800		TCZ-1		NP0K-010		IF Coupling
C36	56	500							Fixed Trimmer †
C37	330	500	912053000						Fixed Trimmer
C38	270	500	912052400						Fixed Padder
C39	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	2nd. Mixer Plate Dec.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: COLLINS PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ⓐ .84A	700VCT .110ADC	5VAC ⓐ 2A	6.3VAC ⓐ 5.5A	662-0017-00		P-3153 ①	PV-120A ①

① Drill new mtg. holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: COLLINS PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T2	3.6KΩ	500Ω Tapped ⓐ .4Ω	290Ω	23Ω Tapped ⓐ .7Ω	667-0018-00				

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ↶)	REPLACEMENT DATA: COLLINS PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
L1	.110ADC	100Ω	3 Henries	668-0020-00	C-2303 ②	C-2994		② Drill one new Mounting Hole
L2	.055ADC	270Ω	5 Henries	668-0019-00	C-1706	C-2975	R-650 ②	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: COLLINS PART No.	REPLACEMENT DATA: MERIT PART No.	NOTES
L3	Ant. Coil	0Ω	.8Ω	504 7038 002		160 Meter
L4	Ant. Coil	.1Ω	.1Ω	504 7039 002		80 Meter
L5	Ant. Coil	.1Ω		504 7000 001		40 Meter
L6	Ant. Coil	.1Ω		504 6999 001		20 Meter
L7	Ant. Coil	.1Ω		504 6997 001		15 Meter
L8	Ant. Coil	.1Ω		504 6996 001		11 Meter
L9	Ant. Coil	.1Ω		504 6996 001		10 Meter
L10	Parasitic Supp.	0Ω		504 7064 001		Wound on 47Ω Resistor
L11	RF Coil	.1Ω		504 7037 002		80 Meter
L12	RF Coil	.1Ω		504 7000 001		40 Meter
L13	RF Coil	.1Ω		504 6999 001		20 Meter
L14	RF Coil	.1Ω		504 6997 001		15 Meter
L15	RF Coil	.1Ω		504 6996 001		11 Meter
L16	RF Coil	.1Ω		504 6996 001		10 Meter
L17	Osc. Coil	.1Ω		504 7004 001		80 Meter
L18	Osc. Coil	.1Ω		504 6998 001		40 Meter
L19	Osc. Coil	0Ω		504 6997 001		20 Meter
L20	Osc. Coil	0Ω		504 7001 001		15 Meter
L21	Osc. Coil	0Ω		504 7001 001		11 Meter
L22	Osc. Coil	0Ω		504 7001 001		10 Meter
L23	Variable IF	.5Ω		504 7005 001		
L24	Variable IF Coil Shunt	1.7Ω		504 7002 001		Used on 10 and 11 meter band only
L25	Variable IF	1Ω		504 7005 001		
L26	Variable IF Coil Shunt	1.7Ω		504 7002 001		Used on 10 and 11 meter band only
L27	Variable IF Padder	.1Ω		505 1738 001		
L28	RF Choke	7.8Ω		240 0073 00		
L29	2nd. Mixer Trans.	1.7Ω	.6Ω	278 0083 00		Tap ⓐ .3Ω
L30	1st. IF Trans.	4.6Ω		278 0085 00		
L31	2nd. IF Trans.	1.6Ω	1.6Ω	278 0084 00		
L32	2nd. IF Trans.	1.6Ω	1.6Ω	278 0084 00		
L33	3rd. IF Trans.	1.6Ω	1.6Ω	278 0084 00		
L34	4th. IF Trans.	1.6Ω	1.6Ω	278 0084 00		
L35	BFO Coil	1.7Ω		278 0082 00		Tap ⓐ .2Ω

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA COLLINS PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C40	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	2nd. Mixer Screen
C41	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	2nd. Mixer Cathode
C42	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	RF Bypass
C43	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	RF Bypass
C44	10	500	912043200	1469-00001		5R5Q1		MS-41	Crystal Filter Shunt
C45	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	AVC Filter
C46	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	1st. IF Amp. Plate
C47	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	1st. IF Amp. Screen
C48	5		916438500	SI5NP0	TCZ-4.7		NP0K-050		IF Coupling
C49	5		916438400	SI5NP0	TCZ-4.7		NP0K-050		IF Coupling
C50	5		916438500	SI5NP0	TCZ-4.7		NP0K-050		IF Coupling
C51	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	AVC Filter
C52	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	2nd. IF Amp. Plate
C53	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	2nd. IF Amp. Screen
C54	10	500	912043200	1468-00001	D6-100	5W5Q1	GP1K-100	1FM-41	IF Coupling
C55	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	AVC Filter
C56	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	3rd. IF Amp. Plate
C57	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	3rd. IF Amp. Screen
C58	.1	150	913023900	P288-1	DF-104	PJ2P1		2TM-P1	3rd. IF Amp. Cathode
C59	10	500	912043200	1468-00001	D6-100	5W5Q1	GP1K-100		IF Coupling
C60	100	500	912049500	1469-0001		5R5Q1		MS-31	IF Coupling
C61	100	500	912049500	1469-0001		5R5Q1		MS-31	BFO Grid Cap
C62	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	BFO Screen
C63	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	RF Bypass
C64	10	500	912043200	1469-00001		5R5Q1		MS-41	BFO Coupling
C65	.1	200	931033300	P288-1	DF-104	PJ2P1		2TM-P1	AVC Filter
C66	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	AVC Amp. Filter
C67	.1	200	931033300	P288-1	DF-104	PJ2P1		2TM-P1	AVC Filter
C68	330	500	912053000	1469-00035	D6-331		GP2K-331		Diode RF Filter
C69	.1	200	931033300	P288-1	DF-104	PJ2P1		2TM-P1	Noise Limiter Filter
C70	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	Audio Coupling
C71	100	500	912049500	1468-0001	D6-101	5W5T1	GP1K-101		AF Amp. Grid Filter
C72	.5	200	931016900	P288-5		PJ2P5		2TM-P5	AF Amp. Cathode
C73	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	Audio Coupling
C74	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	Audio Coupling
C75	100	500	912049500	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Audio Output Grid
C76	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	Audio Output Plate
C77	.1	150	931023900	P288-1	DF-104	PJ2P1		2TM-P1	CW Noise Limiter Cathode
C78	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	RF Bypass
C79	.5	600	931020500	684-5		PJ6P5			RF Bypass
C80	.1	150	931023900	P288-1	DF-104	PJ2P1		2TM-P1	Bias Filter
C81	10000		913056600	SII0000	D6-103	TM5S1	GP2-333-103	5HK-S1	Line Filter

† Some Models use 47MMF in this application (Part No. 912047100)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA COLLINS PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	376-4499-00	Q13-133	AG-60-Z	B-60	Audio Gain Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R1A per instructions
R2A	10KΩ	½	376-3522-00	Q11-116	AM-27-S	B-14	RF Gain Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R2A per instructions
R3A	10KΩ	½	376-4022-00	Q14-116	AM-30-V	B-17	CW Limiter Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R3A per instructions
R4	100Ω	1	377-0122-00				"S" Meter Zero Adjustment Control - Wire Wound

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA COLLINS PART No. FUSE	COLLINS PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	2A. 250V.	264 4070 00	265 1002 00	312002	342001	AGC2	HKP

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA COLLINS PART No.		NOTES
M2	Bayonet	6-8	.15	Brown	262 4070 00		Type No. 47
M3	Bayonet	6-8	.15	Brown	262 4070 00		Type No. 47
M4	Bayonet	6-8	.15	Brown	262 4070 00		Type No. 47
M5	Bayonet	6-8	.15	Brown	262 4070 00		Type No. 47

MISCELLANEOUS

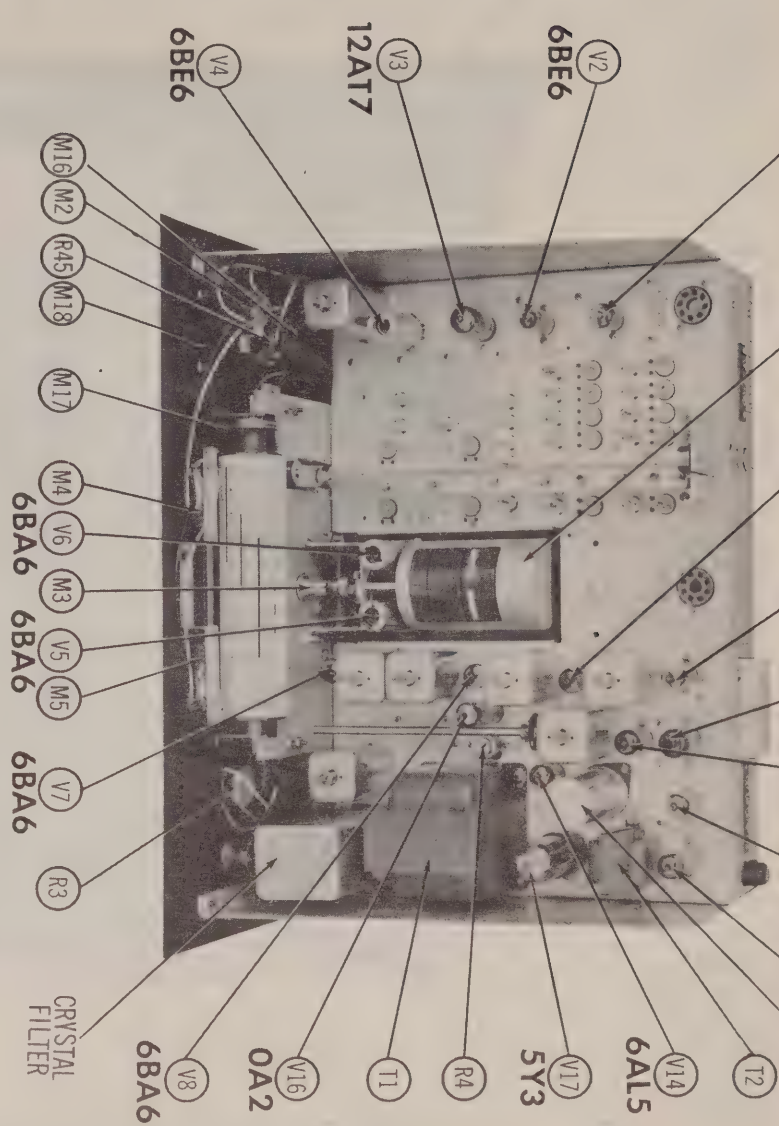
ITEM No.	PART NAME	COLLINS PART No.	NOTES
M6	Crystal	291 8070 00	5.7MC
M7	Crystal	291 8071 00	9.3MC
M8	Crystal	291 8072 00	16.5MC
M9	Crystal	291 8073 00	23.3MC
M10	Crystal	291 8074 00	31.455MC
M11	Crystal	291 8075 00	33.455MC
M12	Crystal	291 5957 00	455KC
M13	Switch	259 0363 00	Off - Stand By - On
M14A	Bandswitch	269 1294 00	Variable IF Selecting
B	Bandswitch	269 1294 00	Variable IF Selecting
C	Bandswitch	269 1294 00	Variable IF Selecting
D	Bandswitch	269 1293 00	Crystal Coil Selecting
E	Bandswitch	269 1293 00	Crystal Selector
F	Bandswitch	269 1296 00	Mixer Grid Coil Selecting
G	Bandswitch	269 1296 00	RF Amp. Grid Coil Selecting
H	Bandswitch	269 1295 00	Antenna Coil Selecting
M15	Switch	259 0415 00	Selectivity
M16	Switch	259 0416 00	CW-AM-FM
M17	Switch	259 0417 00	Limiter
M18	"S" Meter	458 0044 00	1 MA-50Ω±20% DC Res.
M19	VFO Assembly	70E-12	Hermetically Sealed
M20	Variable Air Trimmer	922 0033 00	Antenna (2.6-19.7MMF)
	Trimmers	917 1038 00	(8-50MMF) (Alignment Adjustments A19, A20, A23, A24, A27, A30, A31, A34, A35, A38, A39, A42, A43)
	Trimmers	917 1036 00	(5-25MMF) (Alignment Adjustments A46, A47, A50, A51)

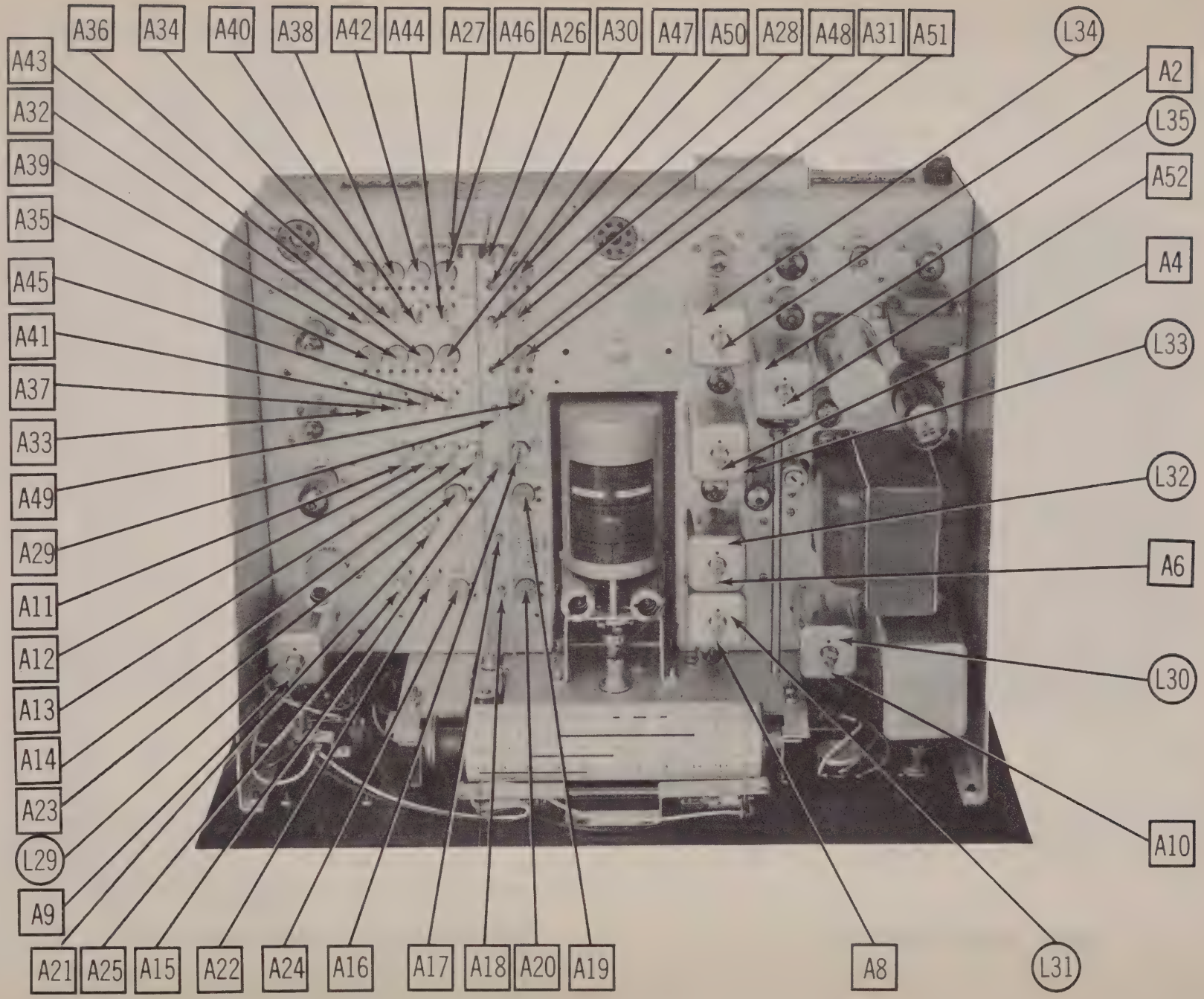
PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	COLLINS PART No.	IRC PART No.	
R5	1Meg	½	745121200		RF Amp. Grid
R6	1Meg	½	745121200		RF Amp. Grid
R7	120Ω	½	745104800	BTS-120	RF Amp. Cathode
R8	33KΩ	½	745114900		RF Amp. Screen
R9	2200	½	745110000	BTS-2200	RF Amp. Plate Decoupling
R10	47Ω	½	745103000		Parasitic Suppressor
R11	10KΩ	½	745112800	BTS-10K	AVC Network
R12	470KΩ	½	745119800		1st. Mixer Grid
R13	560Ω	½	745107600	BTS-560	1st. Mixer Cathode
R14	10KΩ	1	745312800		1st. Mixer Screen
R15	22KΩ	½	745114200		1st. Mixer Injection Grid
R16	2200Ω	½	745110000	BTS-2200	1st. Mixer Plate Decoupling
R17	330Ω	½	745106500	BTS-330	Osc. Cathode
R18	330Ω	½	745106500	BTS-330	Osc. Cathode
R19	4700Ω	½	754111400	BTS-4700	Osc. Grid
R20	2200Ω	½	745110000	BTS-2200	Osc. Plate Decoupling
R21	47Ω	½	745103000		Parasitic Suppressor
R22	1000Ω	1	745308600	BTA-1000	Decoupling
R23	100KΩ	½	745117000		2nd. Mixer Injection Grid
R24	470Ω	½	745107200	BTS-470	2nd. Mixer Cathode
R25	33KΩ	½	745114900		2nd. Mixer Screen
R26	2200Ω	½	745110000	BTS-2200	2nd. Mixer Plate Decoupling
R27	100KΩ	½	745117000		2nd. Mixer Transformer Shunt
R28	33KΩ	½	745114900		Selectivity Network
R29	5600Ω	½	745111800		Selectivity Network
R30	1500Ω	½	745109300		Selectivity Network
R31	10KΩ	½	745112800		1st. IF Amp. Grid
R32	150Ω	½	745105100	BTS-150	1st. IF Amp. Cathode
R33	2200Ω	½	745110000	BTS-2200	1st. IF Amp. Plate Decoupling
R34	47KΩ	½	745115600		1st. IF Amp. Screen
R35	68KΩ	½	745116300		Voltage Divider
R36	10KΩ	½	745112800		2nd. IF Amp. Grid
R37	2200Ω	½	745110000	BTS-2200	2nd. IF Amp. Plate Decoupling
R38	22KΩ	½	745114200		2nd. IF Amp. Screen
R39	68KΩ	½	745116300		Voltage Divider
R40	10KΩ	½	745112800		3rd. IF Amp. Grid
R41	47KΩ	½	745115600		3rd. IF Amp. Screen
R42	2200Ω	½	745110000	BTS-2200	3rd. IF Amp. Plate Decoupling
R43	150Ω	½	745105100	BTS-150	3rd. IF Amp. Cathode
R44	100Ω	½	745104400	BTS-100	Meter Shunt
R45	100Ω	½	745104400	BTS-100	Meter Shunt
R46	100KΩ	½	745117000	BTS-100K	AVC Diode Load
R47	470KΩ	½	745119800	BTS-470K	AVC Filter
R48	120KΩ	½	745117400	BTS-120K	AVC Filter
R49	100KΩ	½	745117000	BTS-100K	AVC Filter
R50	2200Ω	½	745110000	BTS-2200	AVC Amp. Cathode
R51	100Ω	2	745504400		Bias Network
R52	350Ω	10	710135020	1 3/4A-350	Bias Network
R53	120Ω	2	745504800		Bias Network
R54	47KΩ	½	745115600	BTS-47K	Diode Det. Load
R55	47KΩ	½	745115600	BTS-47K	Diode Det. Load
R56	470KΩ	½	745119800	BTS-470K	Diode Filter
R57	470KΩ	½	745119800	BTS-470K	Diode Filter
R58	6800Ω	½	745112100	BTS-6800	AF Amp. Cathode
R59	220KΩ	½	745118400	BTS-220K	AF Amp. Plate
R60	150KΩ	½	745117700	BTS-150K	BFO Grid
R61	33KΩ	½	745114900	BTS-33K	BFO Screen
R62	100KΩ	½	745117000	BTS-100K	BFO Plate
R63	10KΩ	½	745112800	BTS-10K	BFO Decoupling
R64	220KΩ	½	745118400	BTS-220K	Voltage Divider
R65	10KΩ	½	745112800	BTS-10K	Voltage Divider
R66	220Ω	½		BTS-220K	Voltage Divider
R67	68KΩ	1	745116300	BTA-68K	Voltage Divider
R68	100KΩ	½	745117000	BTS-100K	Output Grid
R69	2500Ω	10	710003000	1 3/4A-2500	Voltage Regulator Plate
R70	10Ω	2	745500200		Phone Shunt
R71	3900Ω	1		BTA-3900	Bias Network
R72	3900Ω	1		BTA-3900	Bias Network

CHASSIS—TOP VIEW

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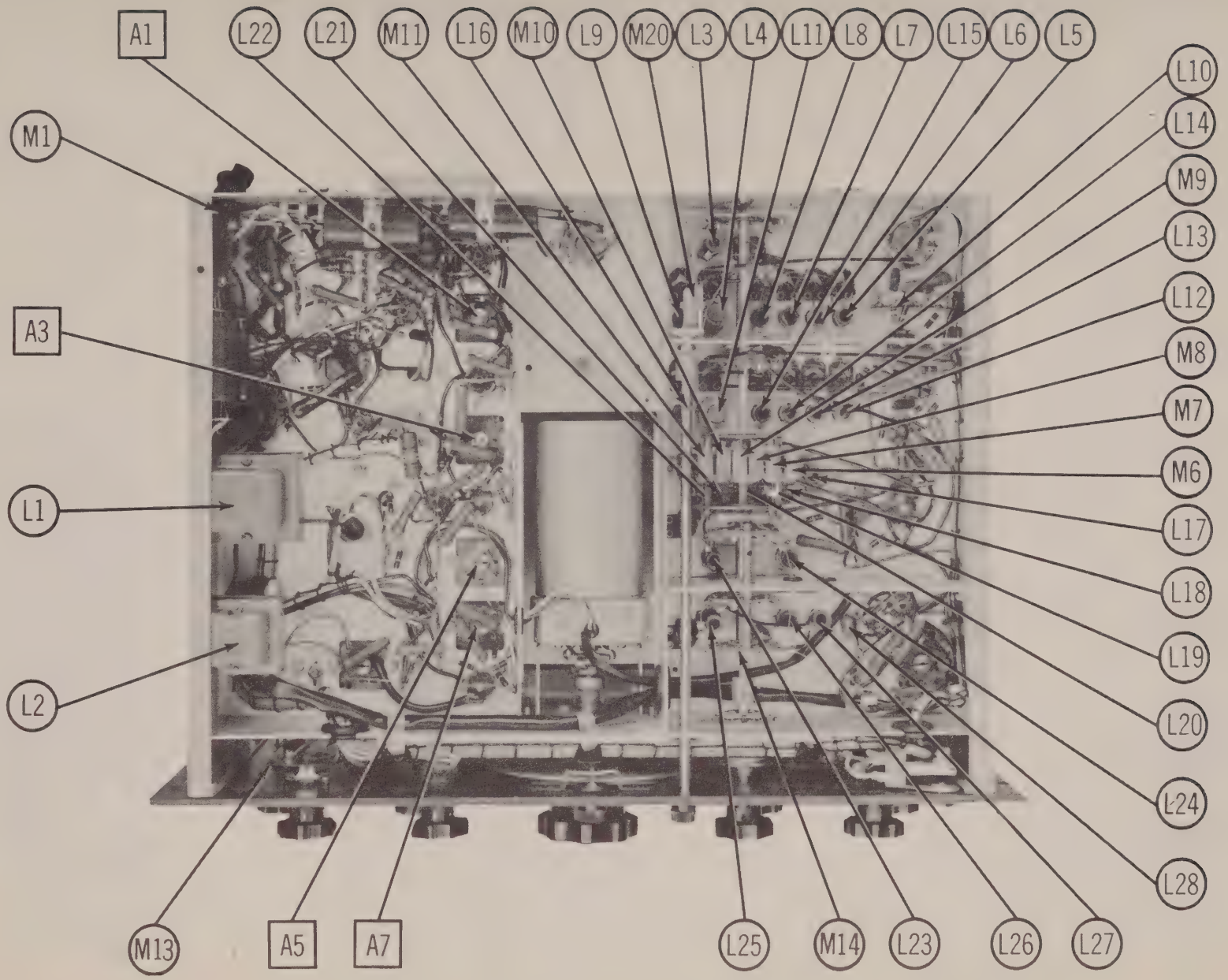
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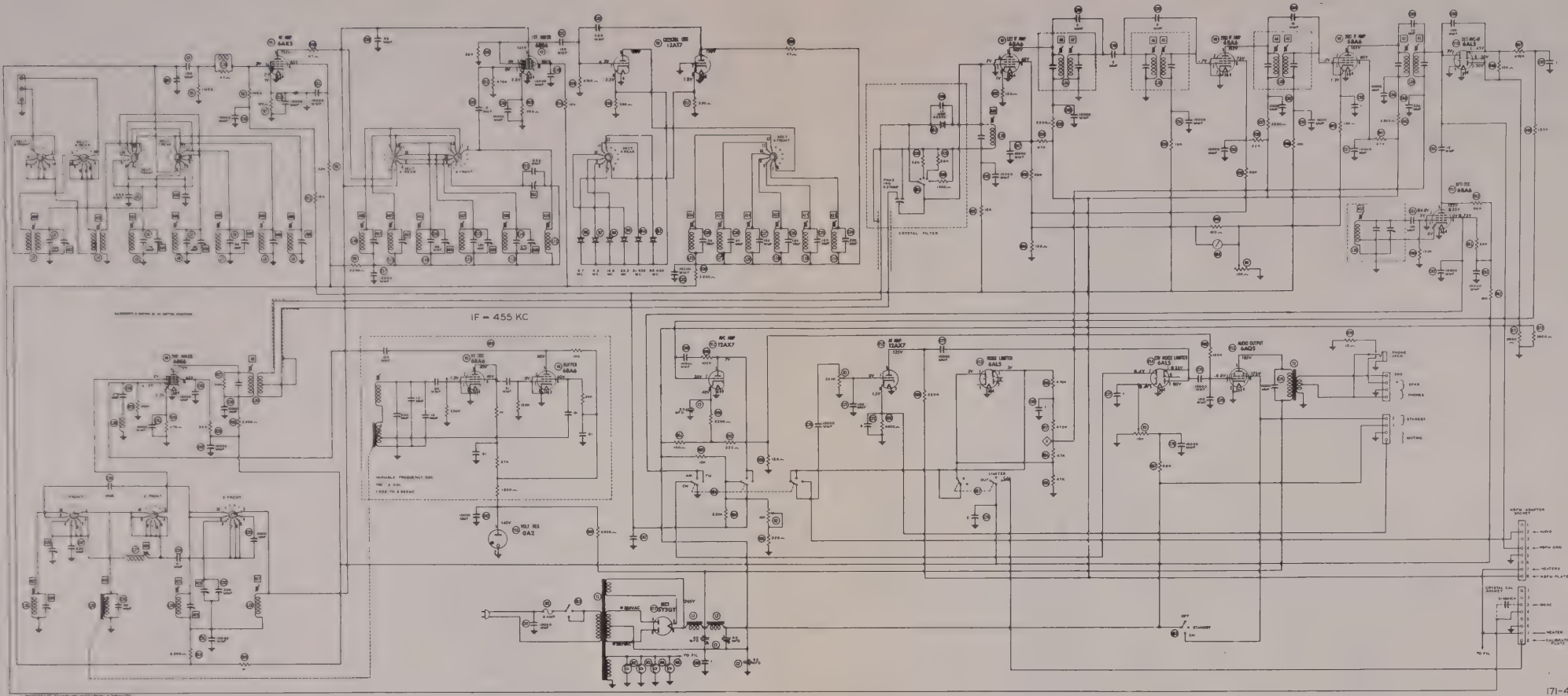


1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

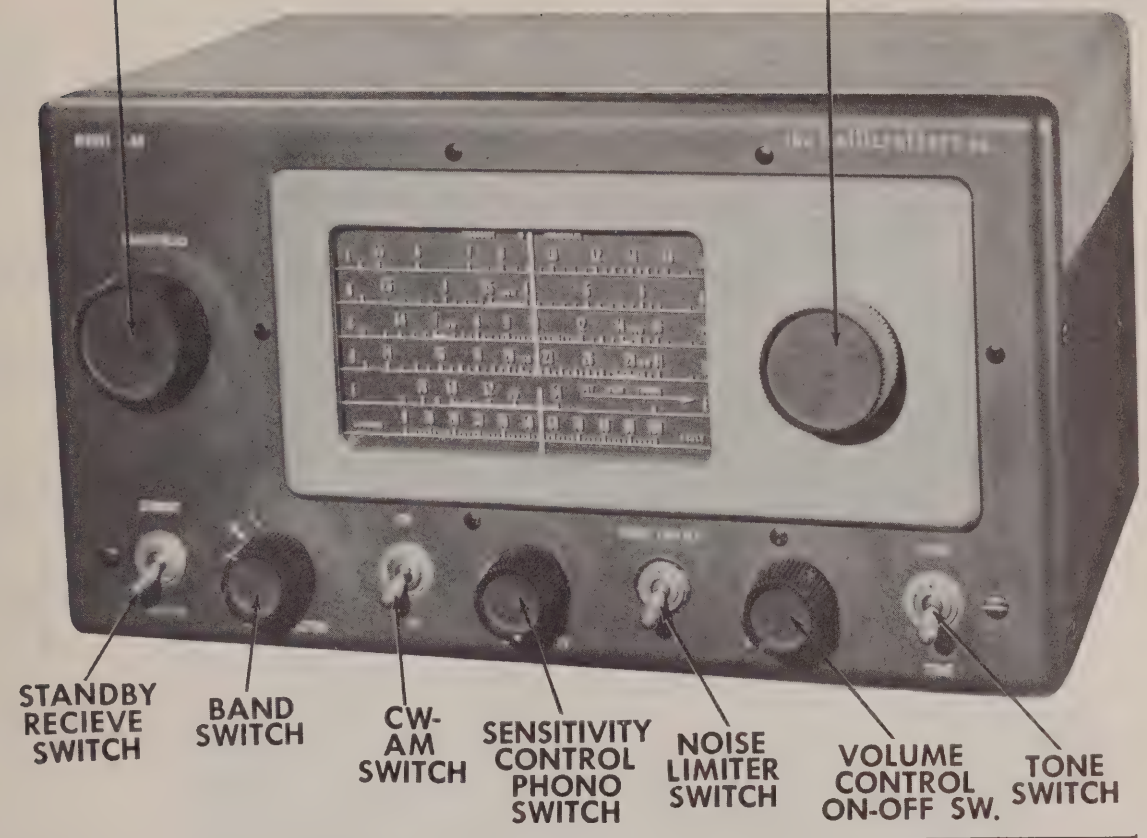
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	3.6Meg	0Ω	0Ω	.1Ω	†5.7KΩ	†16KΩ	68Ω	
V 2	6BE6	47KΩ	.3Ω	.1Ω	0Ω	†3.2KΩ	†16KΩ	2.7Meg	
V 3	6BA6	2.6Meg	0Ω	0Ω	.1Ω	†3.2KΩ	†16KΩ	270Ω	
V 4	6AV6	10Meg	0Ω	.1Ω	0Ω	515KΩ	0Ω	†220KΩ	
V 5	6V6GT	†0Ω	.1Ω	†640Ω	†1KΩ	470KΩ	0Ω	0Ω	270Ω
V 6	5Y3GT	INF	90KΩ	INF	90Ω	INF	100Ω	INF	90KΩ

ALL MEASUREMENTS TAKEN IN RADIO POSITION
† MEASURED FROM PIN 3 OF V23
▲ TAKEN WITH VACUUM TUBE VOLTMETER

PROPERTY OF

HALLICRAFTERS
MODELS S53A, AU

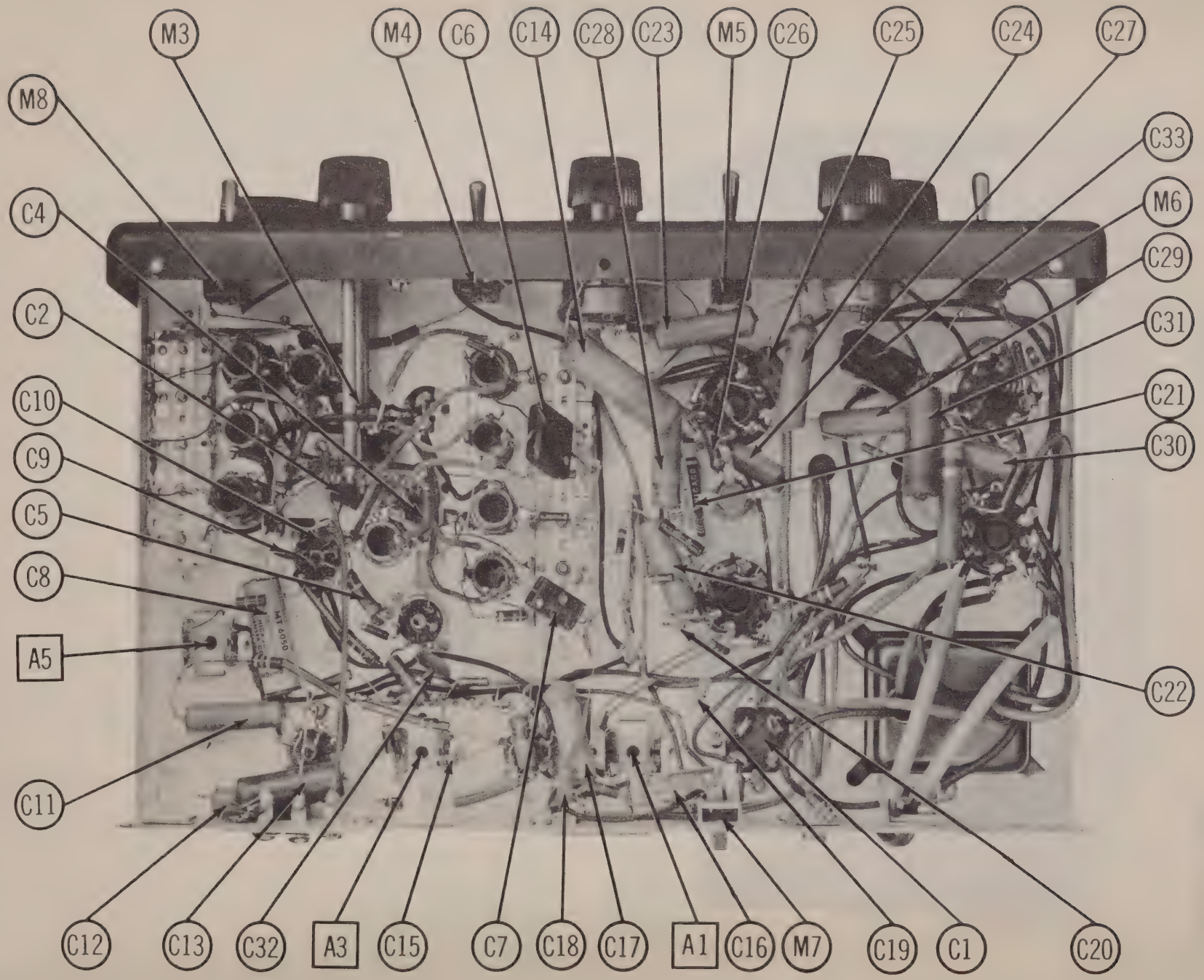


HALLICRAFTERS
MODELS S53A, AU

TRADE NAME	Hallicrafters Model S-53A, S53AU
MANUFACTURER	Hallicrafters Co., 4401 W. 5th Ave., Chicago 24, Ill.
TYPE SET	AC Operated Multi-Band AM Superheterodyne Communications Receiver
TUBES (EIGHT)	TYPES 6BA6 Mixer, 6C4 Osc., 6BA6 1st.IF Amp., 6BA6 2nd IF Amp., 6H6 ANL-Det., 6SC7 AF Amp.-BFO, 6K6GT Audio Output, 5Y3GT Rectifier.
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .43 Amp. @ 117 Volts AC

TUNING RANGE	BAND	FREQ.RANGE
	A	540KC - 1630KC
	B	2.5MC - 6.3MC
	C	6.3MC - 16MC
	D	14MC - 31MC
	E	48MC - 54.5MC

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


M3
M4
C6
C14
C28
C23
M5
C26
C25
C24
C27
M8
C33
C4
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C2
C31
C10
C21
C9
C30
C5
C8
A5
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M7
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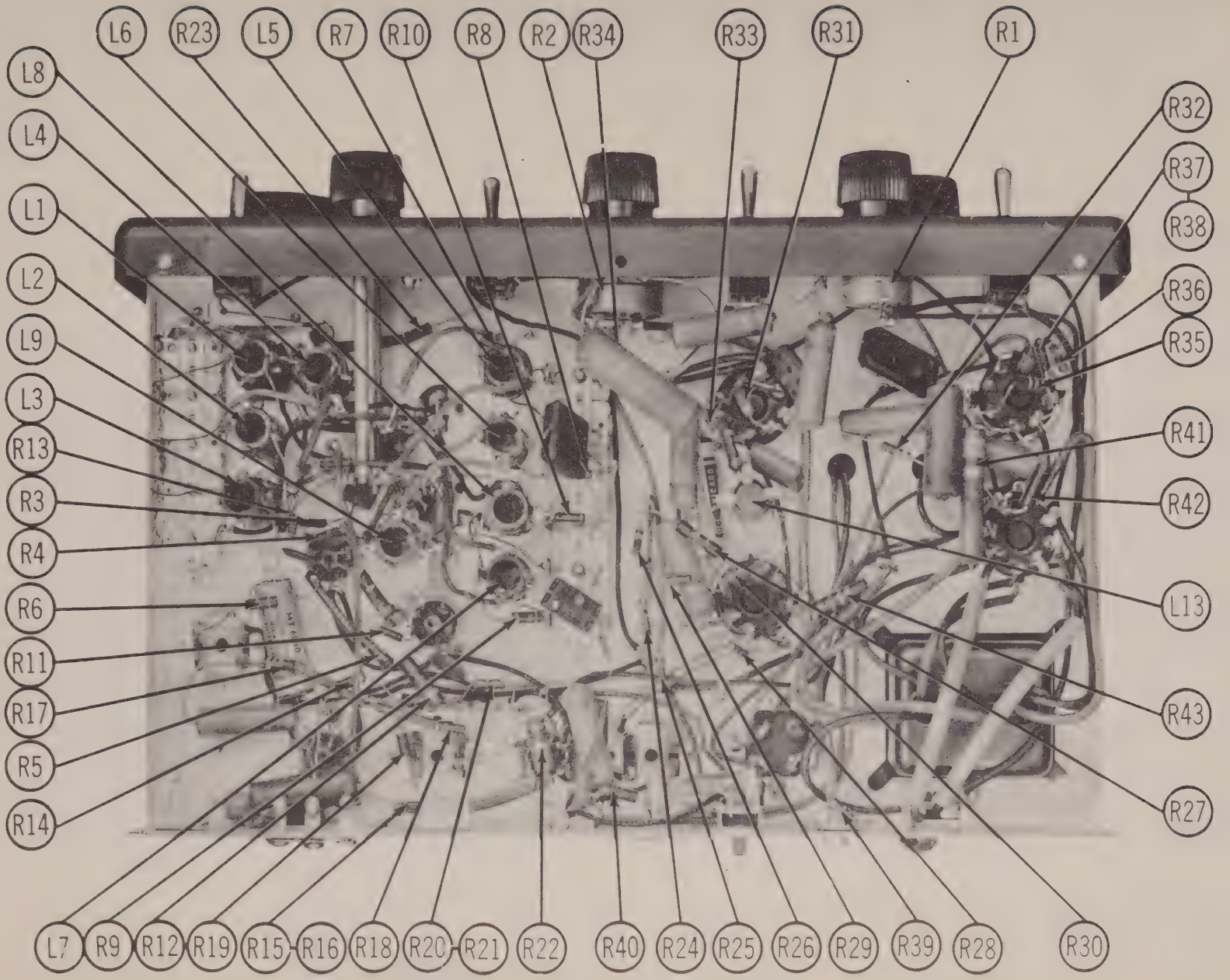
C1
C20



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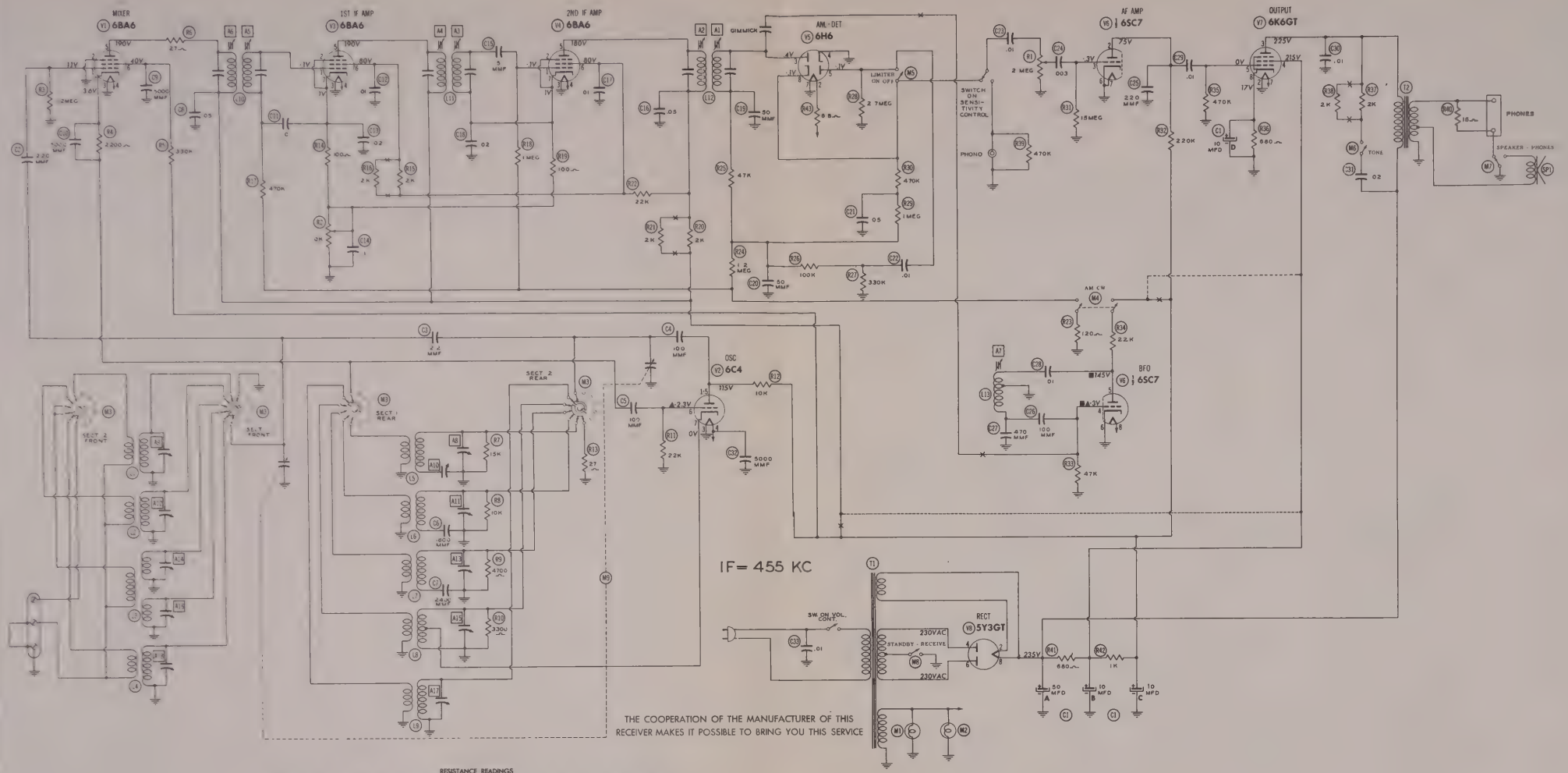

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	1.2Meg	0Ω	0Ω	.1Ω	†1.7KΩ	†330KΩ	2.2KΩ	
V 2	6C4	†11KΩ	INF	0Ω	.1Ω	†11KΩ	22KΩ	.1Ω	
V 3	6BA6	2.1Meg ■470KΩ	100Ω	0Ω	.1Ω	†1.7KΩ	†23KΩ	100Ω	
V 4	6BA6	2.6Meg ■1Meg	100Ω	0Ω	.1Ω	†2.7KΩ	†22KΩ	100Ω	
V 5	6H6	0Ω	2.8Ω	480KΩ	0Ω	1.1Meg	950KΩ	0Ω	1.1Meg
V 6	6SC7	0Ω	†220KΩ	15Meg	47KΩ	■†23KΩ	0Ω	0Ω	.1Ω
V 7	6K6GT	0Ω	0Ω	†600Ω	†680Ω	470KΩ	INF	.1Ω	680Ω
V 8	5Y3GT	†1.7KΩ	60KΩ	0Ω	198Ω	INF	192Ω	INF	60KΩ

SWITCH M3 IN "A" POSITION
SWITCH M4 IN "AM" POSITION
SWITCH M5 IN "OFF" POSITION
SWITCH M6 IN "LOW" POSITION
SWITCH M7 IN "SPEAKER" POSITION
SWITCH M8 IN "RECEIVE" POSITION
SENSITIVITY CONTROL FULLY CLOCKWISE
† MEASURED FROM PIN 8 OF V8
▲ TAKEN WITH VACUUM TUBE VOLTMETER
■ SWITCH M4 IN "CW" POSITION

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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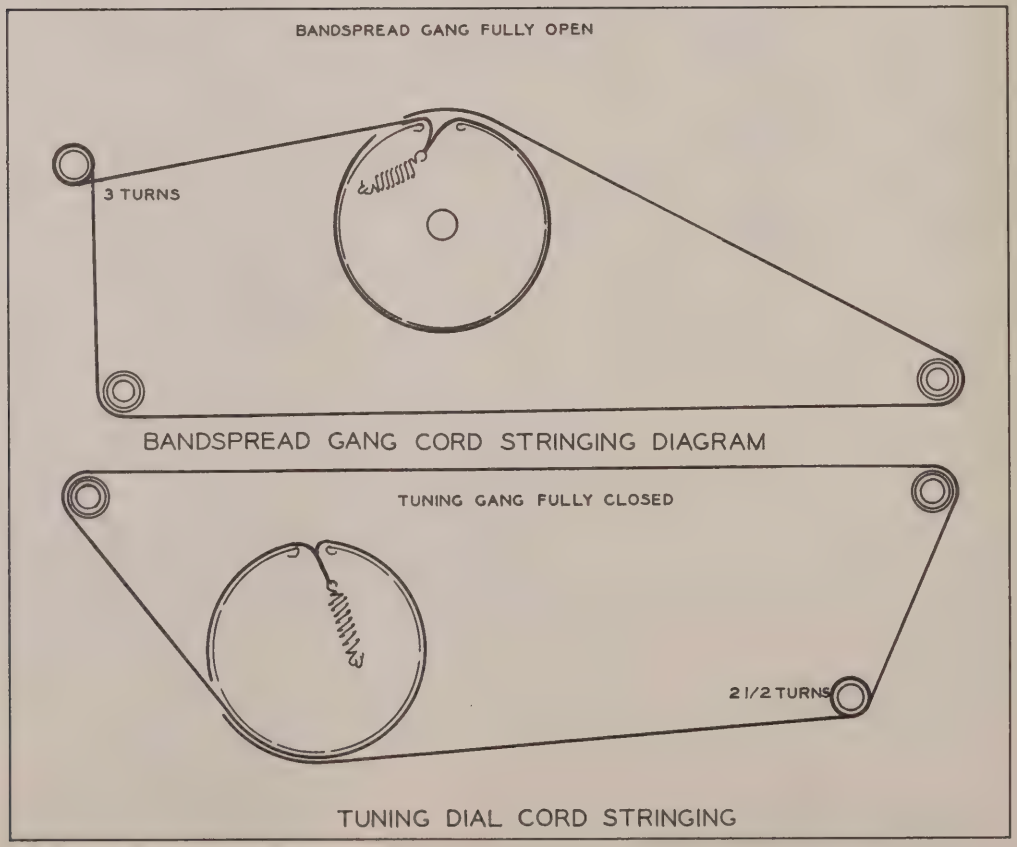
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointers: Bandspread dial - turn bandspread gang fully open and set pointer at 100 on the logging scale. Tuning dial - turn tuning gang fully closed and set pointer to coincide with the left hand index marks.
Preset controls as follows: STANDBY - RECEIVE at "RECEIVE", CW-AM at "AM," NOISE LIMITER at "OFF," TONE at "HIGH," SPEAKER-PHONES at "SPEAKER" and SENSITIVITY, VOLUME and BANDSPREAD fully clockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
1.	.1MFD	High side to stator plates of front section of tuning gang. Low side to chassis.	455KC	A	Tuning gang fully open.	Across voice coil	A1, A2 A3, A4 A5, A6	Adjust for maximum output, output of generator should be no higher than necessary to obtain an output reading.
2.	"	"	"	"	"	"	A7	Set CW-AM Switch at CW and adjust A7 for zero beat. Reset switch to AM.
3.	330Ω carbon resistor	High side thru 330Ω to antenna input terminal. Low side to chassis.	1500KC	. "	1.5MC	"	A8, A9	Adjust for maximum output.
4.	"	"	600KC	"	.6MC	"	A10	"
5.	"	"	6MC	B	6MC	"	A11, A12	"
6.	"	"	15MC	C	15MC	"	A13, A14	"
7.	"	"	30MC	D	30MC	"	A15, A16	"
8.	"	"	52MC	E	52MC	"	A17, A18	"



PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Mixer	90X6BA6	6BA6	7BK	
V2	Oscillator	90X6C4	6C4	6BG	
V3	1st. IF Amplifier	90X6BA6	6BA6	7BK	
V4	2nd. IF Amplifier	90X6BA6	6BA6	7BK	
V5	ANL-Detector	90X6H6	6H6	7Q	
V6	AF Amp.-BFO	90X6SC7	6SC7	8S	
V7	Audio Output	90X6K6GT	6K6GT	7S	
V8	Rectifier	90X5Y3GT	5Y3GT	5T	

CAPACITORS

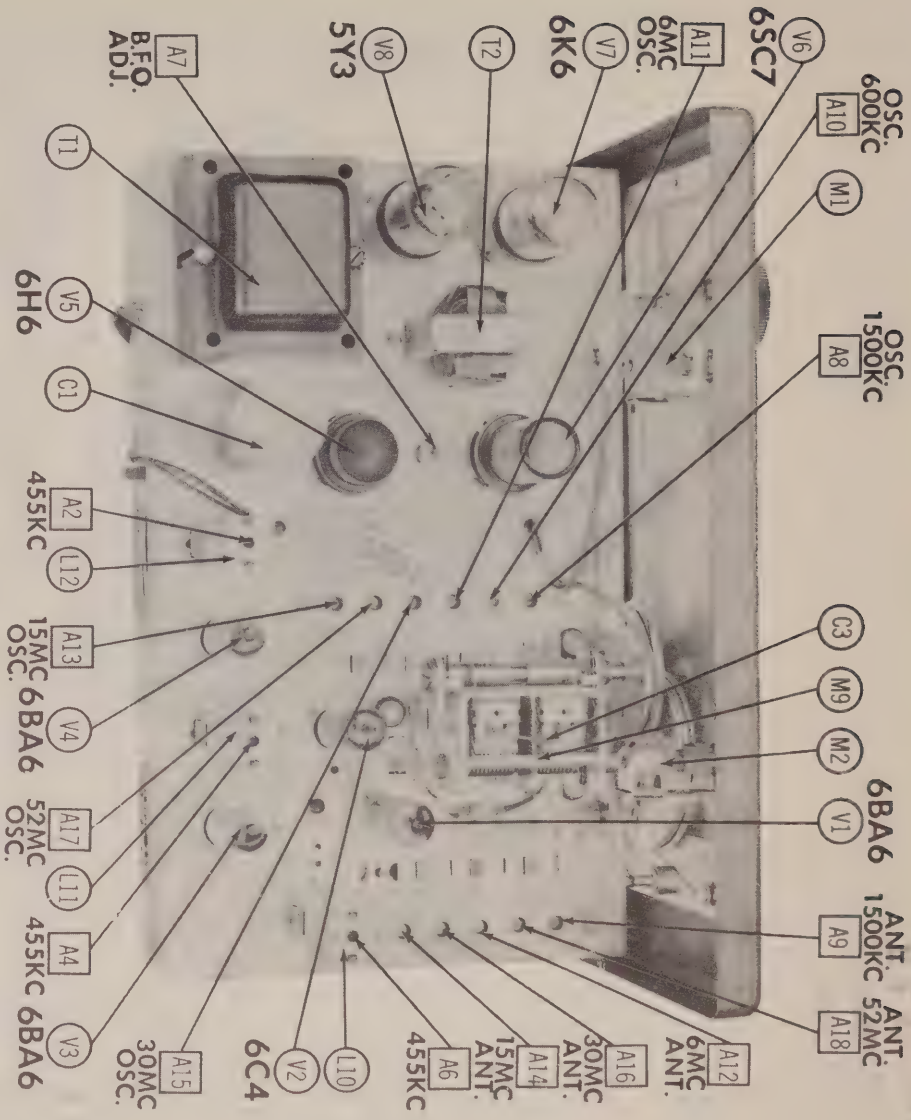
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	350	45B122	AFH4-88		UP4111145		TVL-4769	● Filter
B	10	350						TVA-1204	■ Filter
C	10	350							▲ Decoupling
D	10	25							Audio Output Cathode
C2	220	500	47X20B221K	1468-00025	D6-221	5W5T25	GP2K-221	1FM-325	RF Coupling
C3	2.2		47A160-4		TCZ-2.2		NP0K-2R2		Osc. Coupling
C4	100		47A086	S1100N750	TCN-100		N750L-101	5TCU-T1	Osc. Feedback
C5	100		47A086	S1100N750	TCN-100		N750L-101	5TCU-T1	Osc. Grid Cap.
C6	1800	500	47X20C182G						Fixed Padder
C7	2400	500	47X20C242J	1464-0025		1R5D25			Fixed Padder
C8	.05	600	46AW503J	P688-05	DF-503	PTE6S5		6TM-S5	Mixer Plate Dec.
C9	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Mixer Screen Bypass
C10	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Mixer Cathode Bypass
C11	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	AVC Filter
C12	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	1st. IF Amp. Screen
C13	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	1st. IF Amp. Cathode
C14	.1	200	46AU104J	P288-1	DF-104	PJ2P1		2TM-P1	RF Bypass
C15	5		47X20UK050K	S15N750			N750K-050		IF Coupling
C16	.05	600	46AW503J	P688-05	DF-503	PTE6S5		6TM-S5	2nd. IF Amp. Plate
C17	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	2nd. IF Amp. Screen
C18	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	2nd. IF Amp. Cathode
C19	50		47A091				N750L-500		Diode RF Filter
C20	50		47A091				N750L-500		Diode RF Filter
C21	.05	600	46AW503J	P688-05	DF-503	PTE6S5		6TM-S5	Tone Comp.
C22	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C23	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C24	.003	600	46AZ302J	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Audio Coupling
C25	220	500	47X20B221K	1468-00025	D6-221	5W5T25	GP2K-221	1FM-325	AF Amp. Plate Bypass
C26	100		47A086	S1100N750	TCN-100		N750L-101	5TCU-T1	BFO Grid Cap.
C27	470	500	47X20B471J	1469-0005		5R5T5		MS-35	Fixed Trimmer
C28	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	BFO Feedback
C29	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling
C30	.01	600	46AZ103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Audio Output Plate
C31	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	Tone Comp.
C32	5000		47A168	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Fil. Bypass
C33	.01	600	46AC103J	689ZGXY-01		PJ6S1		6TM-S1	Line Filter

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2Meg	½	25B602	Q13-139	AG-66-Z	B-76-S	Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions
R2A	10KΩ	½	25B603		AM-30-V	B-17-S	Sensitivity Control
B	Shaft		Not Req.		RS-2	Not Req.	Attach to R2A per instructions
C	Switch		Not Req.		SW-A1	Not Req.	Attach to R2A per instructions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	Hallicrafters PART No.	IRC PART No.	
R3	1.2 Meg	½			Mixer Grid - See Note 1
R4	2200Ω	½	23X20X222M	BTS-2200	Mixer Cathode
R5	330KΩ	½	23X20X334K		Mixer Screen
R6	27Ω	½	23X20X270M		Parasitic Suppressor
R7	15KΩ	½	23X20X153K		Osc. Coil Shunt
R8	10KΩ	½	23X20X103K		Osc. Coil Shunt
R9	4700Ω	½	23X20X472K	BTS-4700	Osc. Coil Shunt
R10	3300Ω	½	23X20X332K	BTS-3300	Osc. Coil Shunt
R11	22KΩ	½	23X20X223M		Osc. Grid
R12	10KΩ	1	23X30X103K		Osc. Plate
R13	27Ω	½	23X20X270M		Parasitic Suppressor
R14	100Ω	½	23X20X101K	BTS-100	1st.IF Amp. Cathode
R15	2000Ω	½	23X20X202M		Voltage Divider - See Note 2
R16	2000Ω	½	23X20X202M		Voltage Divider - See Note 3
R17	470KΩ	½	23X20X474M	BTS-470K	AVC Network
R18	1Meg	½	23X20X105M		2nd.IF Amp. Grid
R19	100Ω	½	23X20X101K	BTS-100	2nd.IF Amp. Cathode
R20	2000Ω	½	23X20X202M		Voltage Divider - See Note 2
R21	2000Ω	½	23X20X202M		Voltage Divider - See Note 3
R22	22KΩ	1	23X30X223M	BTA-22K	Voltage Divider
R23	120Ω	½	23X20X121M	BTS-120	AVC Network
R24	1.2Meg	½	23X20X125M	BTS-1.2Meg	AVC Network - See Note 1
R25	47KΩ	½	23X20X473M	BTS-47K	Diode Filter
R26	100KΩ	½	23X20X104K	BTS-100K	Diode Load
R27	330KΩ	½	23X20X334K	BTS-330K	Diode Load
R28	2.7Meg	½	23X20X275M	BTS-2.7Meg	ANL Diode Load
R29	1Meg	½	23X20X105M	BTS-1Meg	ANL Network
R30	470KΩ	½	23X20X474M	BTS-470K	ANL Network
R31	15Meg	½	23X20X156K	BTS-15Meg	AF Amp. Grid
R32	220KΩ	½	23X20X224K	BTS-220K	AF Amp. Plate
R33	47KΩ	½	23X20X473M	BTS-47K	BFO Grid
R34	22KΩ	½	23X20X223M	BTS-22K	BFO Plate
R35	470KΩ	½	23X20X474M	BTS-470K	Output Grid
R36	680Ω	½	23X20X681K	BTS-680	Output Cathode
R37	2000Ω	½	23X20X202M		Tone Compensation - See Note 2
R38	2000Ω	½	23X20X202M		Tone Compensation - See Note 3
R39	470KΩ	½	23X20X474M	BTS-470K	Phono Shunt
R40	15Ω	½	23X20X150M		HeadPhone Shunt
R41	680Ω	2	23X40X681M	BTB-680	Filter
R42	1000Ω	1	23X30X102M	BTA-1000	Filter
R43	6.8Ω	1	23X30X068K		Filament Dropping

Note 1. Some Models use a 1.8 Meg Resistor in this application
Note 2. Some Models use a 1000Ω Resistor in this application
Note 3. Not Used in all Models

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	Hallicrafters PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @.43A	460VCT .050ADC	5VAC @2A	6.3VAC @2.3A	52C164A 52C164 ① 52C165 ②	PM-8403 ④	P-2958	PH-50

① Alternate Transformer
② Used in Model S-53AU
④ Drill two new Mtg. Holes

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Hallicrafters PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	7.5KΩ	15Ω tapped @ 3.2Ω	600Ω	65Ω tapped @.6Ω	55B107A 55B107 ③	A-3856	A-2900	RO-301	③ Alternate Transformer

CHASSIS—BOTTOM VIEW

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Hallicrafters PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	P.M.	3.2Ω	85C030	ST-105 Mod. P5-X	5A1	
	CONE DIA.	V. C. DIA.				
SP1B	5"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Hallicrafters PART No.	MERIT PART No.	
L1	Ant. Coil	42	4.8Ω	51B1028		Band A
L2	Ant. Coil	.3Ω	.2Ω	51B1244		Band B
L3	Ant. Coil	1.2Ω	0Ω	51B1026		Bands C and D
L4	Ant. Coil	0Ω	0Ω	51B1030		Band E
L5	Osc. Coil	1.6Ω	3.3Ω	51B1235		Band A
L6	Osc. Coil	.8Ω	3.3Ω	51B1236		Band B
L7	Osc. Coil	.2Ω	0Ω	51B1237		Band C
L8	Osc. Coil	.1Ω	0Ω	51B1238		Band D
L9	Osc. Coil	0Ω	0Ω	51B1239		Band E
L10	1st.IF Trans.	9.3Ω	8.8Ω	50C241		
L11	2nd.IF Trans.	9.3Ω	8.8Ω	50C241		
L12	3rd.IF Trans.	15.5Ω	15.5Ω	50C242		
L13	BFO Osc.	8Ω		54B043		Tap @ 2.3Ω

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					Hallicrafters PART No.		
M1	Bayonet	6-8	.25	Blue	39A003		Type #44
M2	Bayonet	6-8	.25	Blue	39A003		Type #44

MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M3	Bandswitch	60B323	
M4	Switch	60A285	AM/CW
M5	Switch	60A138	Noise Limiter On/Off
M6	Switch	60A138	Tone
M7	Switch	60A243	Speaker/Phones
M8	Switch	60A138	Stand By/Receive
M9	2 Gang Var. Cap	48C198	(21-429MMF, 21-429MMF)
	Trimmer Strip	44B388	Osc. Assembly (6 Section)
	Trimmer Strip	44B355	Ant. Assembly (5 Section)
	Cabinet	66-438	(Does not include top cover, front panel or escutcheon)
	Dial Scale	22C204	
	Escutcheon	7C066	
	Pointer	82A148	Band Spread
	Pointer	82A149	Main Tuning
	Knob	15A050	Band Selector, Sensitivity, Volume
	Knob	15A048	Band Spread, Tuning

JACKSON
MODELS JP-200, JP-400

JACKSON
MODELS JP-200, JP-400

JACKSON MODEL JP-200

TRADE NAME	Jackson Models JP-200 (3 Speed Manual Player), JP-400 (3 Speed Auto. Record Changer)
MANUFACTURER	Jackson Industries, Inc., 500 E. 40th. St., Chicago, Ill.
TYPE SET	AC Operated Radio-Phono Combination Superheterodyne Receiver
TUBES O(Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC - 60 Cycle
RATING	.240 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1) Low side to B-.	455 KC (400~ Mod)	Tuning gang fully open	Across voice Coil	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1600 KC	"	"	A5	Adjust for maximum output
3.		"	1400 KC	Tune to 1400 KC	"	A6	"
4.		"	600 KC	Tune to 600 KC	"		Check tracking. If necessary bend outer plates of RF section of tuning gang for correct tracking.

After completing alignment replace chassis in carrying case, turn tuning gang fully closed and set pointer parallel with base of chassis at low frequency end of dial.

FOR SERVICE INFORMATION ON AUTOMATIC RECORD CHANGER UNIT USED IN MODEL JP-400 -SEE V-M MODEL 950-PHOTOFACT SET # 107-FOLDER 13 OR RECORD CHANGER MANUAL CM-3.

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PARTS LIST AND DESCRIPTIONS

JACKSON MODEL JP-200

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		JACKSON PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	JACKSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	CED-4415	PRS150/40-40		BRD4415A		TVA-2445	Filter (Red)
B	40	150							Filter (Red)
C2	5		CCC05050M	SI5	TCZ-4.7	5W5V5	GP1K-050	MS-55	RF Coupling *
C3	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	Tuning Gang Isolation *
C4	.05	400	CWZ04503M	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C5	.005	600	CWZ06502M	P688-005	D6-502	PTE6D5	GP-333-502	6TM-D5	Audio Coupling
C6A	.005								Audio Coupling
B	250				♦PC-70				AF Amp. Plate Bypass
C									Audio Output Grid
C7	.02	400	CWZ04203M	P488-02	DF-203	PTE4S2		4TM-S2	Audio Output Plate
C8	.02	400	CWZ04203M	P488-02	DF-203	PTE4S2		4TM-S2	Line Filter
C9	.05	400	CWH04503M	P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

* Not used in all models
♦ Items C6A, C6B, C6C, R7A, R7B are combined in one unit.
When replacing items separately C6B and C6C should total 250MMF

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	A-RVC3028	Q13-137	AG-63-Z	BSK-70-S	Volume Control - See Note
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

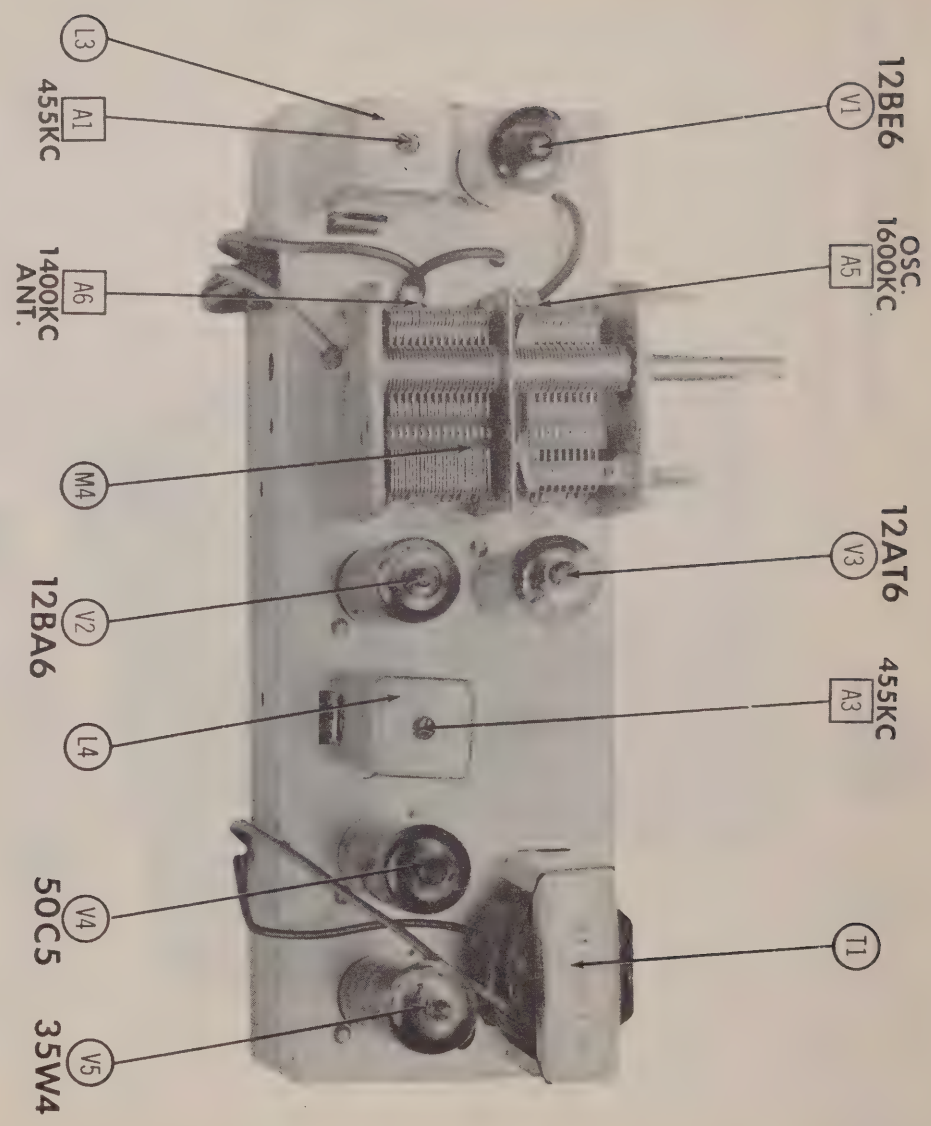
Note. Some models use a 500KΩ control (Part #RVC-3015)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	JACKSON PART No.	IRC PART No.	
R2	22KΩ	½	RCC223M		Osc. Grid
R3	150KΩ	½	RCC154M		IF Amp. Grid
R4	1Meg	½	RCC105M	BTS-1Meg	AVC Network
R5	1Meg	½	RCC105M	BTS-1Meg	Tone Compensation - See Note 1
R6	6.8Meg	½		BTS-6.8Meg	AF Amp. Grid - See Note 2
R7A	500KΩ	½	■		AF Amp. Plate
B	500KΩ	½			Output Grid
R8	150Ω	½	RCC151M	BTS-150	Output Cathode
R9	15Ω	½	RCC150M		Surge Limiter
R10	2200	1	RCF222M	BTA-2200	Filter
R11	220KΩ	½	RCC224M	BTS-220K	Line Isolation
R12	680KΩ	½		BTS-680K	Line Isolation - See Note 3

Note 1. Some models use a 150KΩ resistor in this application.
Note 2. Some models use a 10Meg resistor in this application.
Note 3. Not used in all models.
■ Items R7A, R7B, C6A, C6B, C6C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		JACKSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.2KΩ	3.4Ω	200Ω	.5Ω	A1656-13	A-3876 ①	A-2928 ①	RO-2 ①	① Bend mtg. tabs down and mount in original chassis slots

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	JACKSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.4Ω		ST-105 Mod. P5-X	5A07	
	CONE DIA.	V. C. DIA.				
SP1B	5"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	JACKSON PART No.	MERIT PART No.	
L1	Loop Ant.	1.4Ω		A-1493-10		
L2	Osc. Coil	5.1Ω		A-1492-10		Tap ⓐ .6Ω
L3	Input IF	12.5Ω	13.5Ω	A-1490-10	BC-352	
L4	Output IF	18Ω	14Ω	A-1491-10		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	JACKSON PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1A		LQD-1J	Q Q-33			96	0-1 or S-1 & 0-3 or S-3	Used in Model JP-200
		*7-D		*901D		*2400		*Complete Tone Arm and Cartridge Assembly JP-200
M1B		ACD-J	A-1 A-3	W22AB	A65MG A62A	96	0-1 or S-1 & 0-3 or S-3	Used in Model JP-400

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

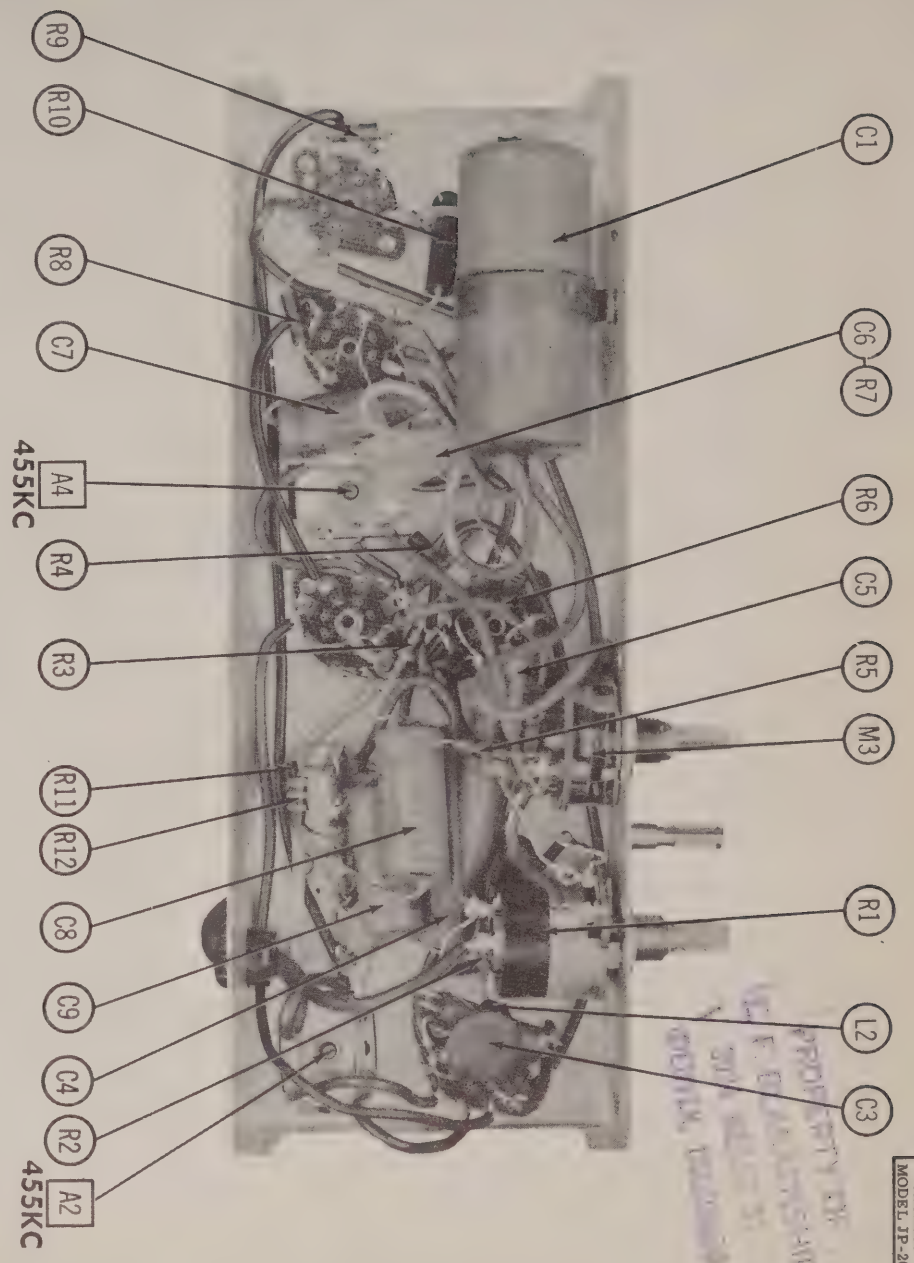
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	JACKSON PART No.	WALCO PART No.	JENSEN PART No.	
M2A		W-2A or W-2S and W-2MGA or W-2MGS	A-80 or A-81 and A-80LP or A-81LP	Used in Model JP-200
M2B		W-30A and W-30MGS	JP-30 and JPS-30LP	Used in Model JP-400

MISCELLANEOUS

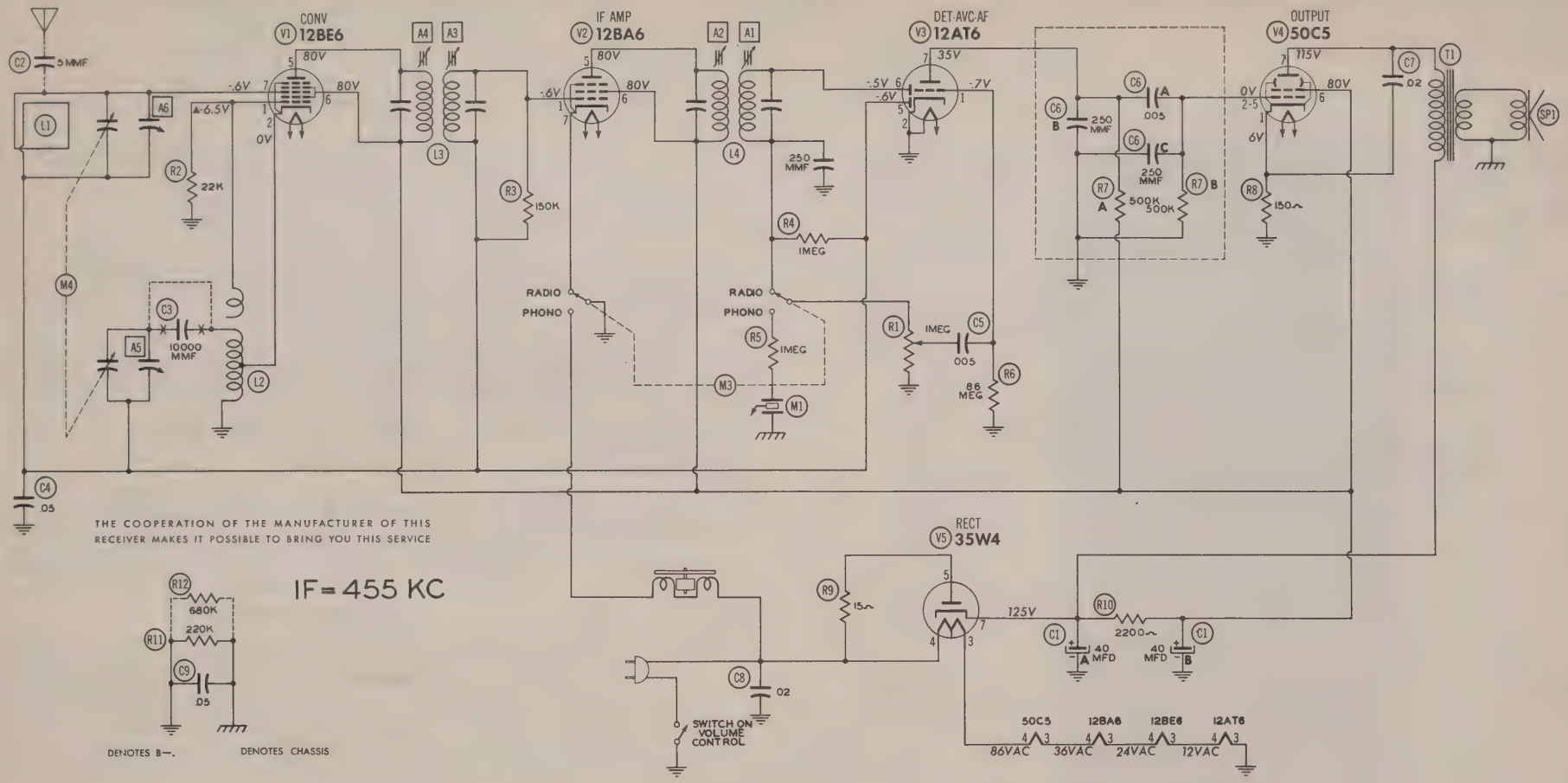
ITEM No.	PART NAME	JACKSON PART No.	NOTES
M3	Switch		Radio - Phono
M4	2 Gang Var. Cap	A-1200-6	(290462MMF, 36-212MMF)

CHASSIS—BOTTOM VIEW



PROPERTY OF
JACKSON

JACKSON
MODEL JP-200



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF = 455 KC

DENOTES B—. DENOTES CHASSIS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.6Ω	12Ω	24Ω	†2.2KΩ	†2.2KΩ	2Meg
V 2	12BA6	2.1Meg	0Ω	24Ω	36Ω	†2.2KΩ	†2.2KΩ	0Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	12Ω	2Meg	1Meg	†500KΩ
V 4	50C5	150Ω	500KΩ	36Ω	86Ω	500KΩ	†2.2KΩ	†200Ω
V 5	35W4	0Ω	INF	86Ω	121Ω	136Ω	103Ω	60KΩ

ALL MEASUREMENTS TAKEN "RADIO" POSITION
† MEASURED FROM PIN 7 OF V5
▲ TAKEN WITH VACUUM TUBE VOLT METER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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171-6

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

JACKSON MODELS
214A, 217A, B, C, 220A, B, 221A, B

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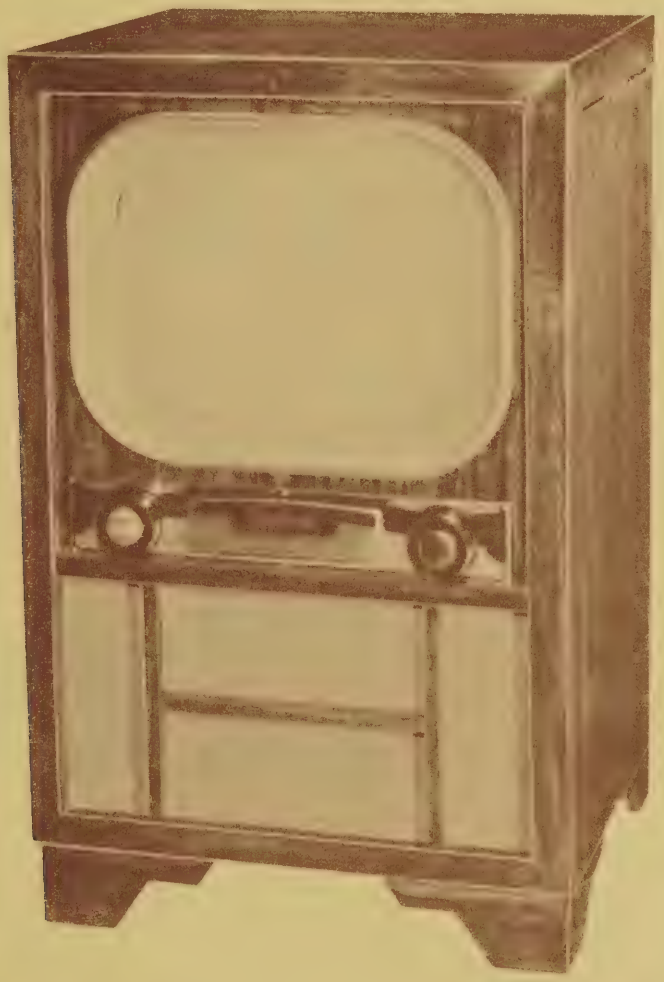
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 217C

JACKSON MODELS
214A, 217A, B, C, 220A, B, 221A, B

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

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DATE 6-52 SET 171 FOLDER 7

PHOTOFACT* Folder
*TRADE MARK

JACKSON MODELS
214A, 217A, B, C, 220A, B, 221A, B

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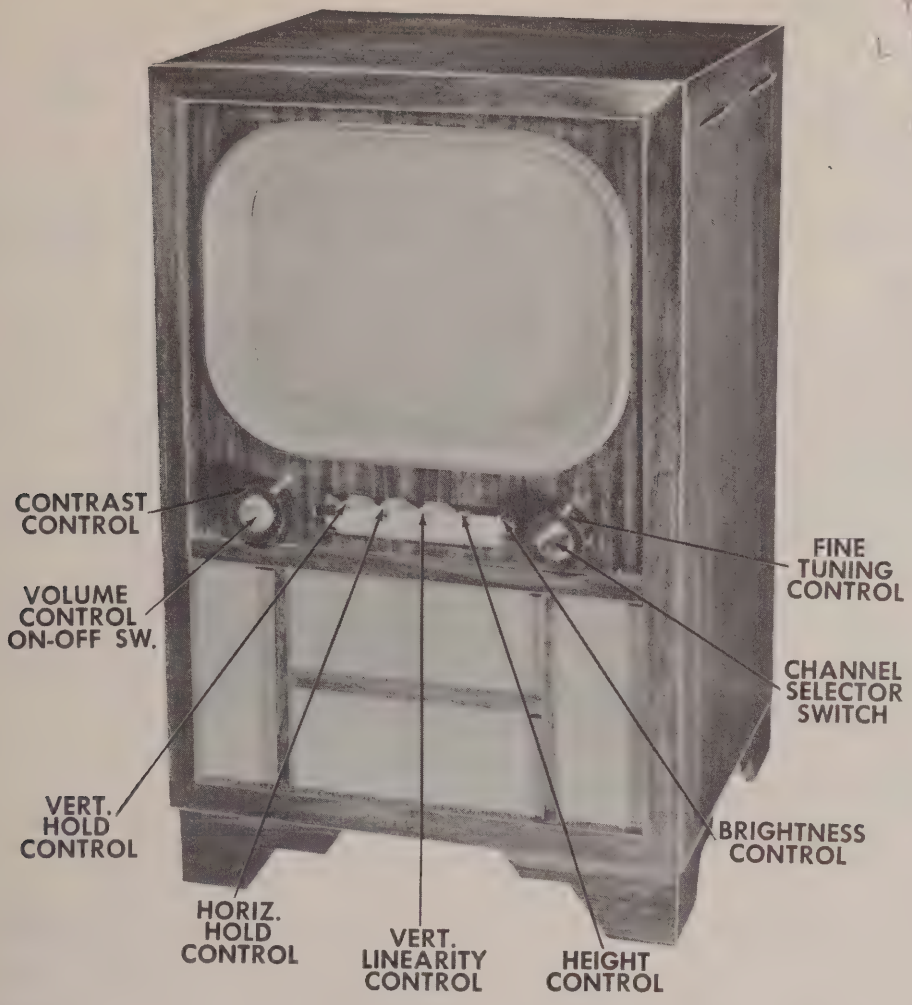

JACKSON 217C

TRADE NAME	Jackson Models 214A, 217A, 217B, 217C, 220A, 220B, 221A, 221B
MANUFACTURER	Jackson Ind., Inc., 500 E. 40th. St., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts - 60 Cycle
RATING	1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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JACKSON MODELS
214A, 217A, B, C, 220A, B, 221A, B

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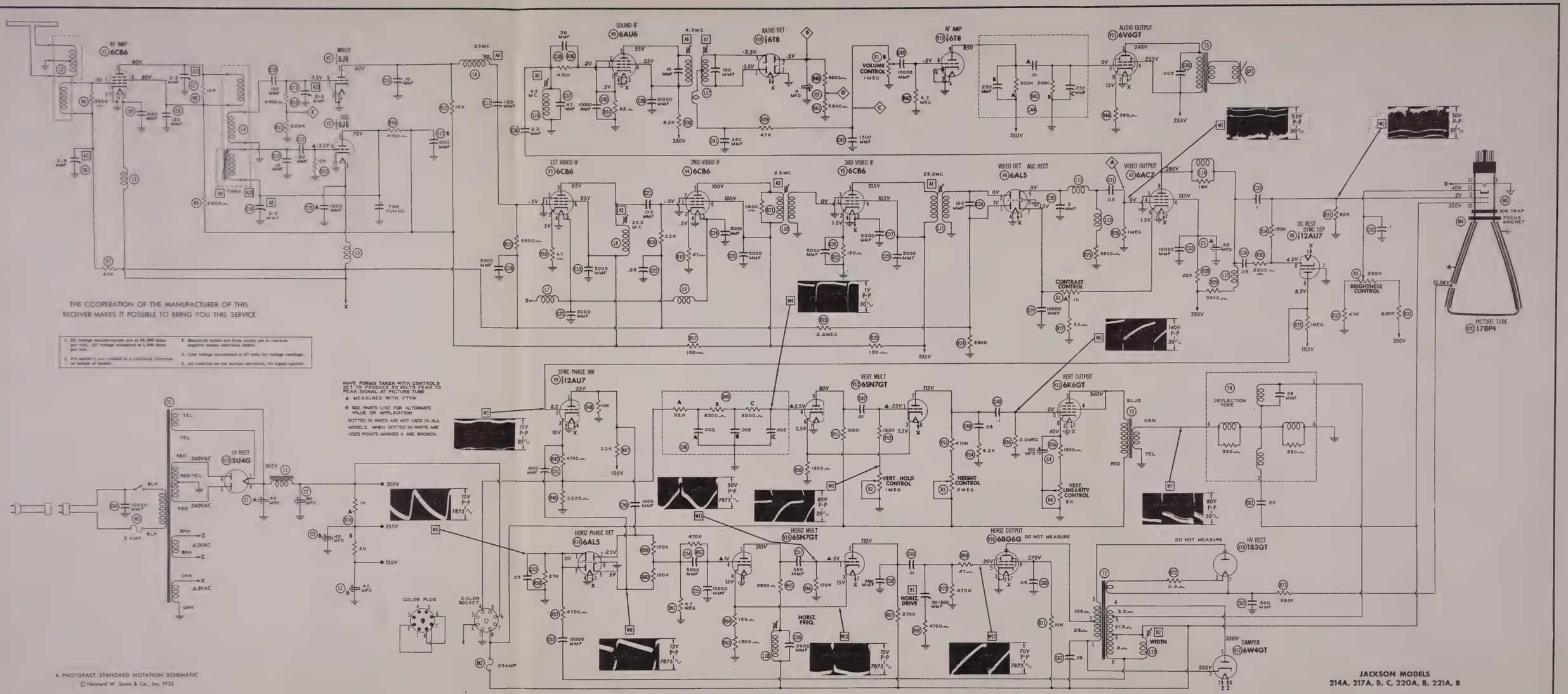
DATE 6-52 SET 171 FOLDER 7


RF AMP V1 6CB6
MIXER V7 ½6J6
OSC V2 ½6J6
SOUND IF V9 6AU6
RATIO DET V10 ½6T8
AF AMP V10 ½6T8
AUDIO OUTPUT V11 6V6GT
1ST VIDEO IF V3 6CB6
2ND VIDEO IF V4 6CB6
3RD VIDEO IF V5 6CB6
VIDEO DET AGC RECT V6 6AL5
VIDEO OUTPUT V7 6AC7
SYNC PHASE INV V8 ½12AU7
VERT MULT V12 6SN7GT
VERT OUTPUT V13 6K6GT
HORIZ PHASE DET V14 6AL5
HORIZ MULT V15 6SN7GT
HORIZ OUTPUT V16 6BG6G
DAMPER V17 6W4GT
HV RECT V18 1B3GT
LV RECT V19 5U4G
DC REST. SYNC SEP V18 ½12AU7
PICTURE TUBE V20 17BP4
VOLUME CONTROL 1 MEG
CONTRAST CONTROL 1K
BRIGHTNESS CONTROL 250K
VERT. HOLD CONTROL 1 MEG
HEIGHT CONTROL 3 MEG
VERT. LINEARITY CONTROL 8K
HORIZ. DRIVE 50-500 MMF
HORIZ. FREQ.
WIDTH
FINE TUNING
DEFLECTION YOKE
ION TRAP
FOCUS MAGNET
COLOR PLUG
COLOR SOCKET
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
1. DC voltage measurements are at 20,000 ohms per volt; AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
▲ MEASURED WITH VTVM
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
DO NOT MEASURE
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214A, 217A, B, C, 220A, B, 221A, B

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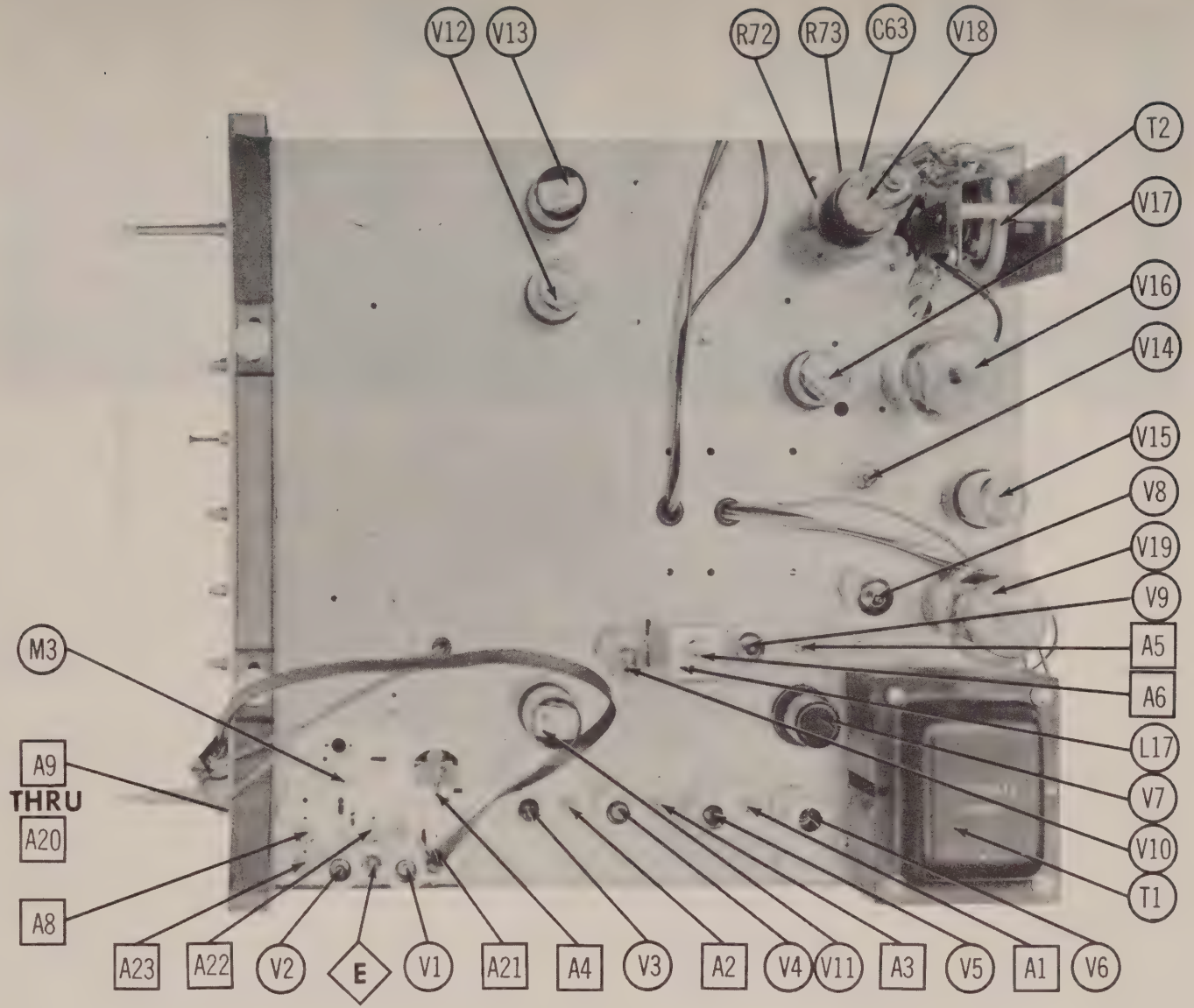
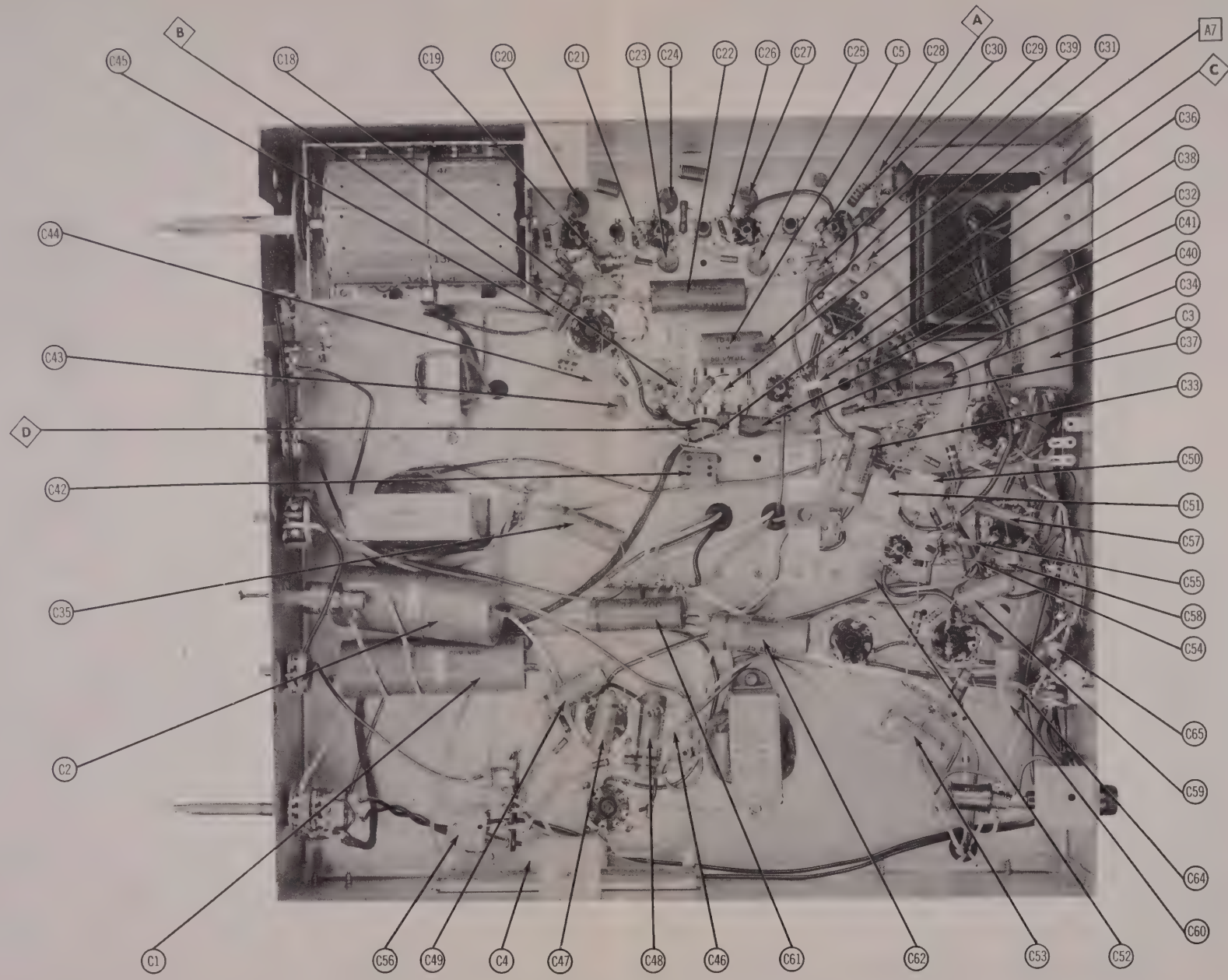


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C22. Connect the positive lead to chassis. Remove the converter tube, (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications. Set contrast control to maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.2MC (Unmod.)	Any	DC probe to point (A) Common to chassis.	A1, A2	Adjust for maximum deflection. Attenuate signal generator output to maintain approximately 1 volt reading.
2.	"	"	23.0 MC	Any	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC swp.)	21.25MC 22MC 24.3MC 25.75MC	Any	Vert. amp. to Point (A) Low side to chassis.		Check for response curve as per Fig. 1 with markers as shown. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B) Common to chassis.	A5, A6	Adjust for maximum deflection. Attenuate signal generator to maintain approximately 1 volt reading.
5.	"	"	"	"	DC probe to point (C) Common to point (D)	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B) Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per fig. 2.
5.	"	"	"	"	"	Vert. Amp. to point (C) Low side to chassis.	A7	Reconnect capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube from its socket and replace with the original 6J6.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A8. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A8 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC swp.)	211.25MC 215.75MC	13	Vert. amp. to point (A) Low side to chassis.	A9	Adjust to place sound marker as in Fig. 4. Video marker should be at 50%.
			207MC (10MC swp.)	205.25MC 209.75MC	12		A10	
			201MC (10MC swp.)	199.25MC 203.75MC	11		A11	
			195MC (10MC swp.)	193.25MC 197.75MC	10		A12	
			189MC (10MC swp.)	187.25MC 191.75MC	9		A13	
			183MC (10MC swp.)	181.25MC 185.75MC	8		A14	
			177MC (10MC swp.)	175.25MC 179.75MC	7		A15	
			85MC (10MC swp.)	83.25MC 87.75MC	6		A16	
			79MC (10MC swp.)	77.25MC 81.75MC	5		A17	
			69MC (10MC swp.)	67.26MC 71.75MC	4		A18	
			63MC (10MC swp.)	61.25MC 65.75MC	3		A19	
			57MC (10MC swp.)	55.25MC 59.75MC	2		A20	

ALIGNMENT INSTRUCTIONS (CONT.)

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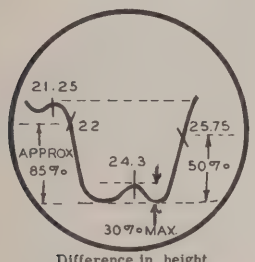
DENVER, COLORADO

RF AND MIXER ALIGNMENT

Remove the 1.5 volt bias battery.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to point (E) Low side to chassis.	A21, A22, A23	Adjust for response curve similar to fig. 5.
8.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check all channels for response as in fig. 5 If markers fall below 70% response on any one channel a compromise adjustment of A21, A22, and A23 may be necessary. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			



Difference in height of peaks not to exceed 30%

FIG. 1

FIG. 2

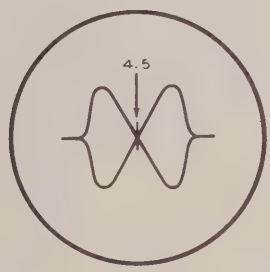


FIG. 3

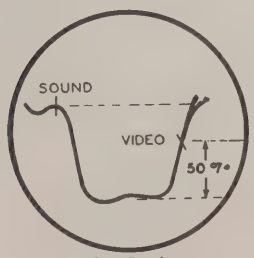


FIG. 4

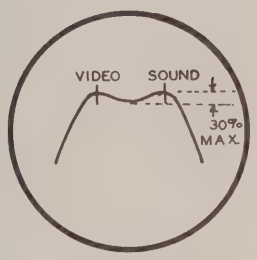
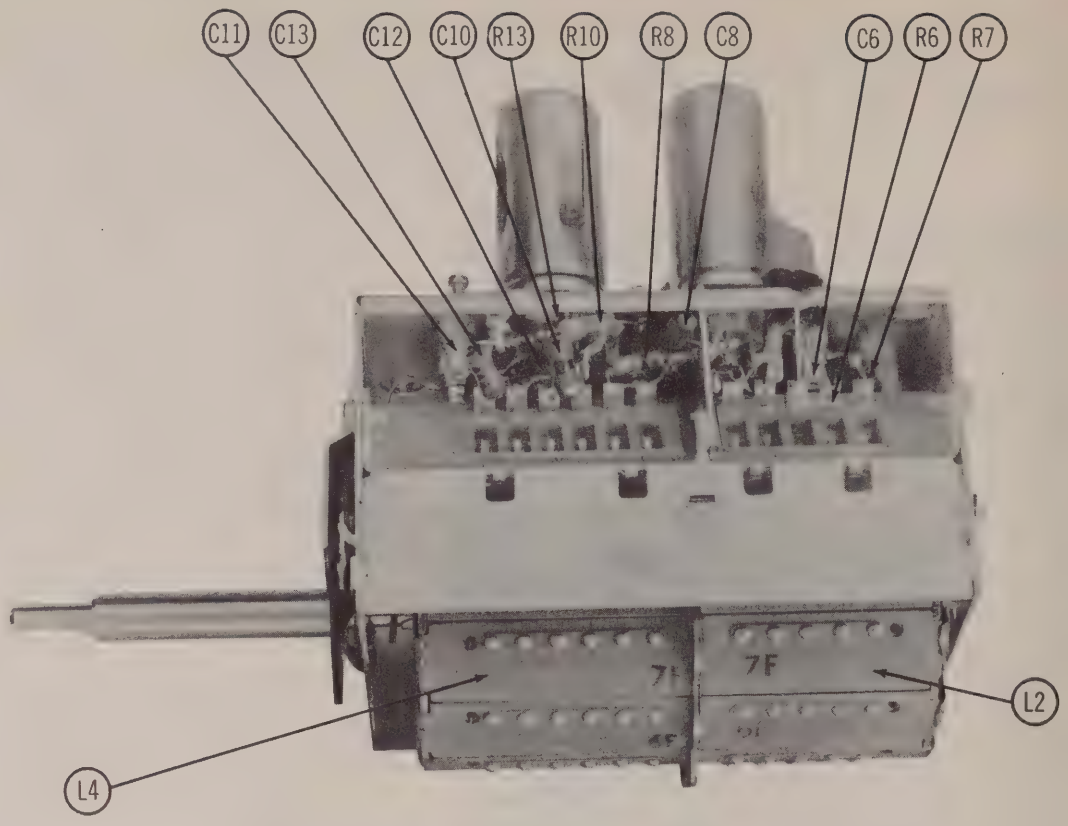


FIG. 5

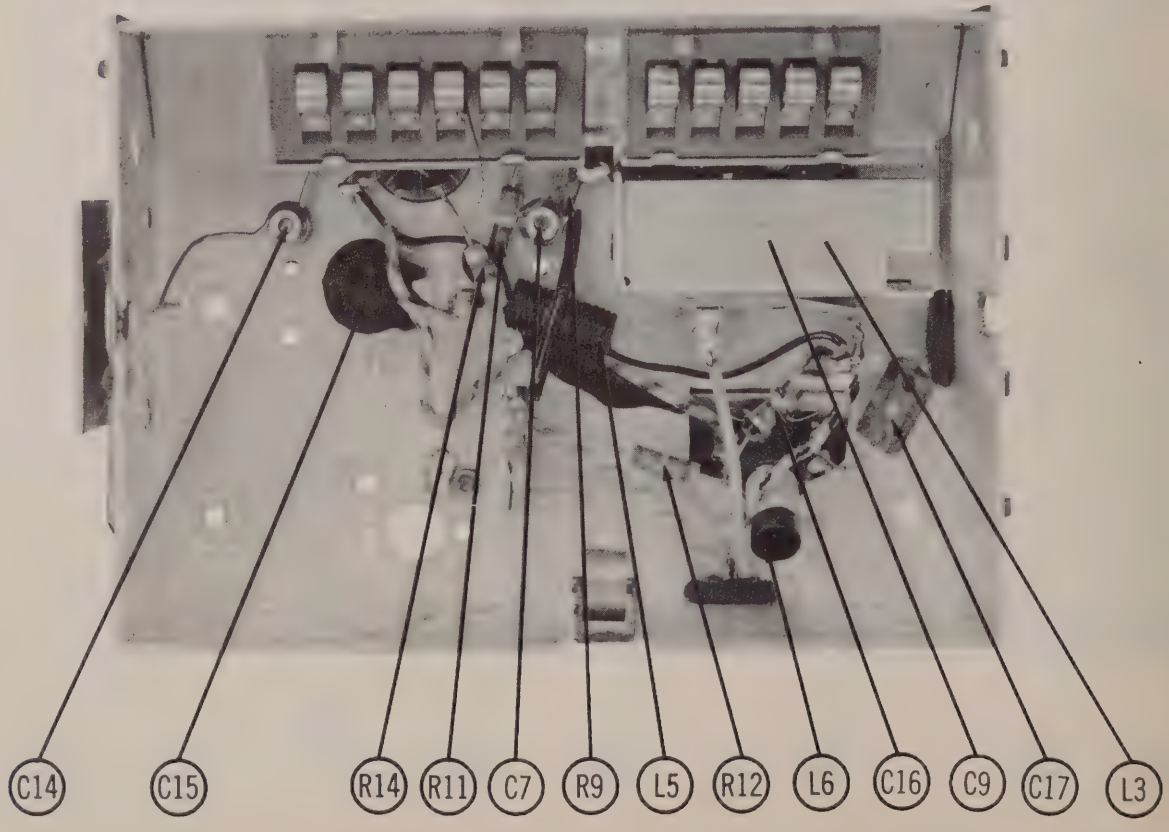
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2.9Meg	0Ω	.1Ω	0Ω	†6.5KΩ	†6.5KΩ	0Ω		
V 2	6J6	†9KΩ	19KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	2.8Meg	47Ω	.1Ω	0Ω	†4.3KΩ	†4.3KΩ	0Ω		
V 4	6CB6	2.9Meg	47Ω	.1Ω	0Ω	†4.1KΩ	†4.1KΩ	0Ω		
V 5	6CB6	.3Ω	150Ω	.1Ω	0Ω	†4KΩ	†4KΩ	0Ω		
V 6	6AL5	1.1KΩ	.3Ω	.1Ω	0Ω	5.6KΩ	0Ω	680KΩ		
V 7	6AC7	0Ω	.1Ω	0Ω	1Meg	100Ω	†65KΩ	0Ω	†5.6KΩ	
V 8	12AU7	7.5KΩ	†1Meg	6.9KΩ	.1Ω	.1Ω	†1Meg	0Ω	230KΩ	0Ω
V 9	6AU6	470KΩ	82Ω	.1Ω	0Ω	†82KΩ	†82KΩ	82Ω		
V 10	6T8	1Meg	13KΩ	1Meg	0Ω	.1Ω	0Ω	0Ω	4.7Meg	†500KΩ
V 11	6V6GT	INF	0Ω	†1.6KΩ	†1KΩ	500KΩ	INF	.1Ω	390Ω	
V 12	6SN7GT	470KΩ	†900KΩ	1.5KΩ	40KΩ	†100KΩ	1.5KΩ	0Ω	.1Ω	
V 13	6K6GT	†65KΩ	0Ω	†855Ω	†855Ω	2.2Meg	1.5KΩ	.1Ω	3KΩ	
V 14	6AL5	27KΩ	27KΩ	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V 15	6SN7GT	100KΩ	†270KΩ	1.6KΩ	5.1Meg	†4KΩ	1.6KΩ	.1Ω	0Ω	
V 16	6BG6G	INF	0Ω	0Ω	INF	470KΩ	470KΩ	.1Ω	†10KΩ	TOP CAP #29Ω
V 17	6W4GT	INF	INF	INF	INF	†66Ω	INF	¶0Ω	¶.2Ω	
V 18	1B3GT	PINS 1 THRU 8 HAVE INF RESISTANCE								TOP CAP #385Ω
V 19	5U4G	INF	28KΩ	INF	23Ω	INF	25Ω	INF	28KΩ	
V 20	17BP4	0Ω	82KΩ	PIN 10 †55Ω	PIN 11 55KΩ	PIN 12 .1Ω				

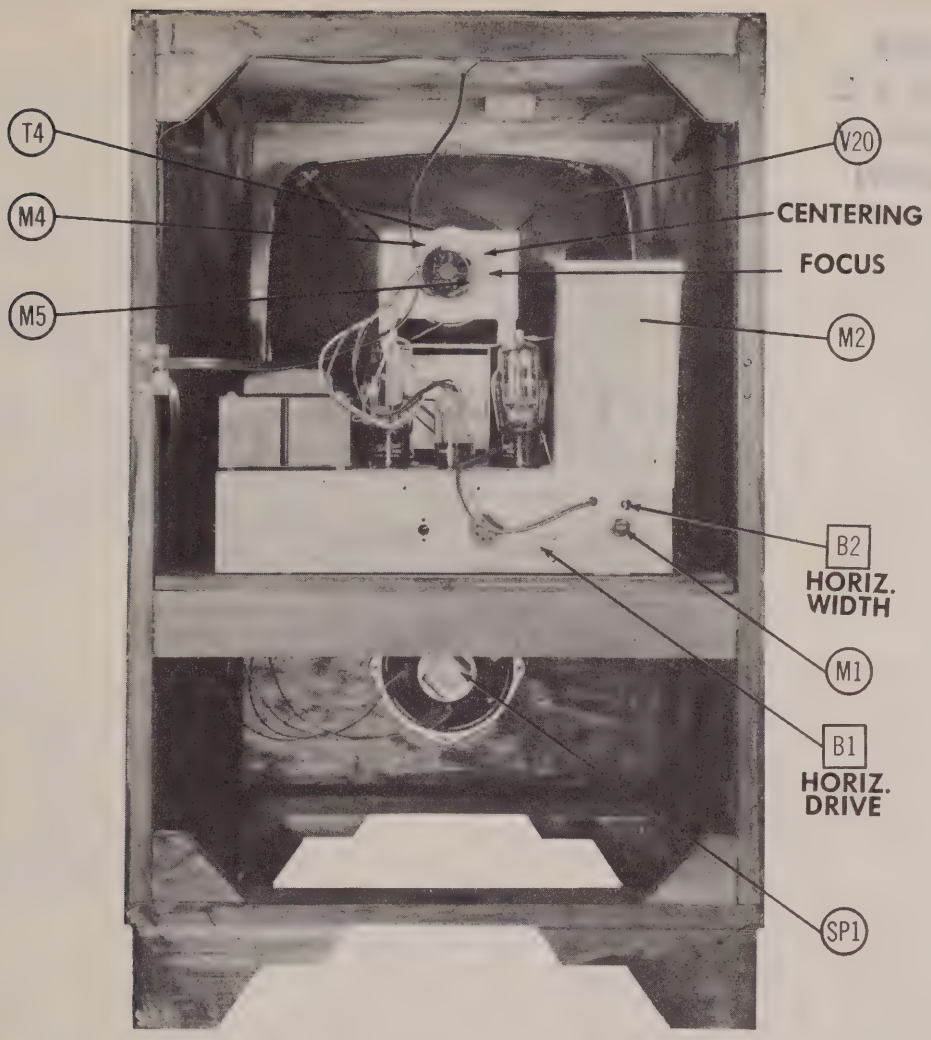
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V19
# MEASURED FROM PIN 3 OF V17
¶ MEASURED FROM PIN 7 OF V17



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Set the horizontal hold at the middle of the range through which the picture remains in sync.

Turn the width control (B2) fully clockwise. Adjust the horizontal drive trimmer (B1) for the best compromise between maximum brightness and horizontal linearity.

Turn B2 counter clockwise until picture is slightly wider than enough to fill the picture mask.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 6 wood screws. Remove rear cover.
3. Disconnect built-in antenna and speaker.
4. Remove 4 wood screws. Remove AC interlock bracket and antenna terminals.
5. Remove 2 nuts holding speaker. Remove speaker.
6. Remove 2 wood screws and 5 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6CB6	6CB6	7CH	
B	RF Amplifier	6BC5	6BC5	7BD	Not directly interchangeable
C	RF Amplifier	6AG5	6AG5	7BD	Not directly interchangeable
V2	Converter	6J6	6J6	7BF	
V3A	1st. Video IF Amp.	6CB6	6CB6	7CH	
B	1st. Video IF Amp.	6BC5	6BC5	7BD	Not directly interchangeable
C	1st. Video IF Amp.	6AG5	6AG5	7BD	Not directly interchangeable
V4A	2nd. Video IF Amp.	6CB6	6CB6	7CH	
B	2nd. Video IF Amp.	6BC5	6BC5	7BD	Not directly interchangeable
C	2nd. Video IF Amp.	6AG5	6AG5	7BD	Not directly interchangeable
V5A	3rd. Video IF Amp.	6CB6	6CB6	7CH	
B	3rd. Video IF Amp.	6AU6	6AU6	7BK	Not directly interchangeable
V6	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Output	6AC7	6AC7	8H	
V8	DC Restorer-Sync. Separator-Sync. Phase Inv.	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector-AF Amplifier	6T8	6T8	9E	
V11	Audio Output	6V6GT	6V6GT	7AC	
V12	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V13	Vert. Output	6N6GT	6N6GT	7B	
V14	Horiz. Phase Det.	6AL5	6AL5	6BT	
V15	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BG6G	6BG6G	5BT	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RMA BASE TYPE	NOTES
V20A	17BP4	17BP4	12C	
B	17AP4	17AP4	12D	
C	14BP4	14BP4	12D	
D	14CP4	14CP4	12D	
E	20CP4	20CP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	CED4445	PRS450/40-40		UPT4445		TVA-2740	Filter
B	40	450							Decoupling
C2	80	450	CES8045	PRS450/40-40		UP8045		TVA-1716	Filter
C3A	40	450	CED4445	PRS450/40-40		UPT4445		TVA-2740	Video Output Screen †
B	40	450							Audio Output Dec. ‡
C4	100	50		PRS50/100		BRH501		TVA-1310	Vert. Output Cathode †
C5	4	50	CES0405	PRS150/4		BR550		TVA-1303	Stabilizing Cap.
C6	3-9				829-10				Variable Trimmer
C7	.5-3		CVC030ST		829-3				Variable Trimmer
C8	120		CCU05121K	SI120	D6-121	TM5T12	GP2K-121	5GA-T12	RF Amp. Decoupling
C9	1000		CCZ05102Y	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	RF Amp. Fil. Bypass
C10	100		CCU05101K	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	RF Coupling
C11	.5-3		CVC030ST		829-3				Variable Trimmer
C12	20		CCC05200K	SI20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C13	10		CCU05100K	SI10N750	TCN-10		N750K-100	5TCU-Q1	Fixed Trimmer
C14	.5-3		CVC030ST		829-3				Variable Trimmer
C15A	1000		CDZ-5102Y	BPD-2X001	DD-2-102	TM5DD5	812-001	5HK-2D1	Conv. Fil. Bypass
B	[illegible]								RF Bypass
C16	10		CCC05100K	SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C17	120		CCU05121K	SI120	D6-121	TM5T12	GP2K-121	5GA-T12	IF Coupling
C18	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	AGC Filter
C19	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Dec.
C20	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	1st. Video IF Fil.
C21	100		CCU05101K	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C22	.25	300	CPZ02254M	P488-25		PJ2P25		2TM-P25	AGC Filter
C23	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Dec.
C24	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	2nd. Video IF Fil.
C25	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Dec.
C26	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Cathode
C27	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Fil.
C28	100		CCU05101K	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C29	10000		CDZ05103Y	BPD-01	DD-103	TM5S1	821-01	5HK-S1	RF Bypass
C30	15		CCC05050M	SI5NP0	TCZ-4.7		NP0K-050		Video Det. Filter
C31	.05	200	CPZ02503M	P288-05	DF-503	PJ2S5		2TM-S5	Video Coupling
C32	10000		CDZ05103Y	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Video Output Screen
C33	.1	400	CPZ04104M	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C34	.05	800	CPZ06503M	P688-05	DF-503	PTE6S5		6TM-S5	Video Coupling
C35	.1	600	CPZ04104M	P488-1	DF-104	PTE4P1		4TM-P1	RF Bypass
C36	2.2		CCG05022D		TCZ-2.2		NP0K-2R2		Sound IF Coupling
C37	47		CCU05470K	SI47	D6-470	5R5Q5	GP1K-470	5GA-Q47	Fixed Trimmer
C38	35		CCG05390M	SI39	D6-396	5R5Q4	GP1K-390		Sound IF Grid
C39	10000		CDZ05103Y	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Sound IF Decoupling
C40	10000		CDZ05103Y	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Sound IF Cathode
C41	350			1468-00035				1FM-335	Diode Load Cap. ¶
C42	1500	500	CMA05152M	1468-0015	D6-152	1W5D15	GP2L-152	1FM-215	De-Emphasis
C43	10000		CDZ05103Y	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Audio Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C44A	.01							†102C1	Audio Coupling
B	250		†A-1376-6F		†PC-80				AF Amp. Plate Bypass
C									Audio Output Grid
C45	.005	600	CWZ06502M	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C46A	.002			P688-002		PTE6D2	GP2-333-202		Vert. Integrator Net.
B	.005		●A-1375-6F	P688-005	●PC-100	PTE6D5	GP2-333-502	●101C1	Vert. Integrator Net.
C	.005			P688-005		PTE6D5	GP2-333-502		Vert. Integrator Net.
C47	.01	600	CPZ06103M	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Vert. MV Feedback
C48	.05	600	CPZ06503M	P688-05	DF-503	PTE6S5		6TM-S5	Vert. Discharge
C49	.1	600	CPZ06104M	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep DCoupling
C50	1000	500	CMA05102K	1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Sync. Coupling
C51	1000	500	CMA05102K	1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Sync. Coupling
C52	10000		CDZ05103Y	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Voltage Divider
C53	.05	800	CPZ06503M	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Feedback
C54	5000		CDZ05502Y	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. AFC Coupling
C55	10000		CDZ05103Y	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Horiz. AFC Filter
C56	3900	500	CMB05392K	1464-004		1DR5D4			Fixed Trimmer
C57	350			1469-00035					Horiz. MV Feedback
C58	390	500	CMA05391K	1469-0004		5R5T4		MS-34	Horiz. Discharge
C59	.01	600	CPZ06103M	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Horiz. Sweep Coupling
C60	.05	600	CPZ06503M	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C61	.25	200	CPZ02254M	P488-25		PJ2P25		2TM-P25	Horiz. Sweep Coupling
C62	.25	600	CPZ06254M	684-25		PTE6P25		6TM-P25	Damper Filter
C63	500	20000	CDZ20K501	HV20C	TV3-502	MM-C20T5			HV Filter
C64	10000		CDZ05103Y	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Line Filter
C65	100						N330L-101		Fixed Trimmer

† Some models combine C3A, C3B and C4 in one unit. C3A is 10MFD, C3B is 20MFD, C4 is 150MFD (Part #CET2IC45)
¶ Some models use 330MMF in this application (Part #CMA05331K)
● Items C46A, C46B, C46C, R49A, R49B, R49C are combined in none unit.
† Items C44A, C44B, C44C, R43A, R43b are combined in one unit.
When replacing items separately C44B and C44C should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	100Ω	½	RVM-100S	QJ-258 *		SBB-636-S	Contrast control - Panel
B	1Meg	½					Volume Control & SW - Rear
R2A	1Meg	½	RVC-101N	QJ1-137	AG-61-S	AN-69	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	3Meg	½	RVC-102N	QJ1-140	AG-85-S	AN-84	Height Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R3A per instructions
R4	5000Ω	2	RVC-103N	W-5000	43-5000	VK-135	Vert. Linearity Control - Wire Wound
R5A	250KΩ	½	RVC-100N	QJ1-130	AG-55-S	AN-50	Brightness Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions

* CONCENTRIKIT EQUIVALENT- KIT K-2, BASE FLEMENTS & SHAFTS B11-108 & P1-204 (Panel), B13-137 & R2-216 (Rear) and SWITCH 76-1

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R6	3900Ω	½	RCC392K	BTS-3900	Antenna Coil Shunt
R7	47KΩ	½	RCC473M		RF Amp. Grid
R8	10KΩ	½	RCC103K	BTS-10K	RF Coil Shunt
R9	2200Ω	20% ½	RCC222M	BTS-2200	RF Amp. Decoupling
R10	4700	½	RCC472M	BTS-4700	Mixer Grid
R11	220KΩ	20% ½	RCC224M		Mixer Grid
R12	15KΩ	20% ½	RCC153M	BTS-15K	Mixer Plate
R13	10KΩ	½	RCC103K	BTS-10K	Osc. Grid
R14	4700Ω	½	RCC472M	BTS-4700	Osc. Plate
R15	6800Ω	20% ½	RCC682K		1st. Video IF Amp. Grid - See Note 1
R16	47Ω	5% ½	RCC470M		1st. Video IF Amp. Cathode - See Note 2
R17	150Ω	20% ½	RCC151M	BTS-150	Decoupling - See Note 3
R18	22KΩ	5% ½	RCC223M		2nd. Video IF Amp. Grid - See Note 4
R19	47Ω	5% ½	RCC470M		2nd. Video IF Amp. Cathode - See Note 2
R20	150Ω	20% ½	RCC101M	BTS-150	Decoupling - See Note 3
R21	5600Ω				3rd. Video IF Coil Shunt - See Note 5
R22	150Ω		RCC151M	BTS-150	3rd. Video IF Amp. Cathode - See Note 6
R23	2.2Meg		RCC225M	BTS-2.2Meg	AGC Network
R24	680KΩ	20% ½	RCC684M	BTS-680K	AGC Rectifier Diode Load
R25	5600Ω			BTS-5600	Video Det. Diode Load - See Note 7
R26	1Meg	20% ½	RCC105M	BTS-1Meg	Video Output Grid
R27	82Ω	½	RCC820M	BTS-82	Video Output Cathode
R28	82KΩ	1	RCF823K	BTA-82K	Video Output Screen
R29	5600Ω	2	RCG562K	BTB-5600	Video Output Plate
R30	2200Ω	½	RCC222M	BTS-2200	Video Peaking
R31	82KΩ	1	RCF823K	BTA-82K	Picture Tube Grid - See Note 8
R32	47KΩ	20% ½	RCC473M	BTS-47K	Voltage Divider
R33	220KΩ	20% ½	RCC224M	BTS-220K	Voltage Divider
R34	150KΩ	20% ½	RCC154M	BTS-150K	DC Restorer Cathode - See Note 9
R35	1Meg	20% ½	RCC105M	BTS-1Meg	DC Restorer Plate
R36	470KΩ	20% ½	RCC474M		Sound IF Amp. Grid
R37	82Ω	½	RCC820M	BTS-82	Sound IF Amp. Cathode
R38	82KΩ	1	RCF823K		Sound IF Amp. Decoupling
R39	47KΩ	20% ½	RCC473M	BTS-47K	De-emphasis
R40	6800Ω	20% ½	RCC682K	BTS-6800	Ratio Det. Diode Load
R41	6800Ω	20% ½	RCC682K	BTS-6800	Ratio Det. Diode Load
R42	4.7Meg	20% ½	RCC475M	BTS-4.7Meg	AF Amp. Grid - See Note 10
R43A	500KΩ		†A-1376-6F		AF Amp. Plate
B	500KΩ				Output Grid
R44	390Ω	1	RCF391M	BTA-390	Output Cathode
R45	4700Ω	20% ½	RCC472M	BTS-4700	Sync. Phase Inverter Cathode
R46	2200Ω	½	RCC222M	BTS-2200	Sync. Phase Inverter Cathode
R47	22KΩ	1	RCF223K	BTA-22K	Sync. Phase Inverter Plate
R48	10KΩ	½	RCC103K	BTS-10K	Voltage Divider
R49A	22KΩ		●A-1375-6F	BTS-22K	Integrator Network
B	8200Ω			BTS-8200	Integrator Network
C	8200Ω			BTS-8200	Integrator Network

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R50	1500Ω	½	RCC152M	BTS-1500	Vert. MV Cathode
R51	100KΩ 20%	½	RCF104M	BTA-100K	Vert. MV Plate
R52	150KΩ 20%	½	RCC154M	BTS-150K	Vert. MV Grid
R53	470KΩ 20%	½	RCC474M	BTS-470K	Vert. MV Plate
R54	8200Ω	½		BTS-8200	Vert. Peaking - See Note 1
R55	2.2Meg	½	RCC225M	BTS-2.2Meg	Vert. Output Grid
R56	1500Ω	½	RCC152M	BTS-1500	Vert. Output Cathode
R57	4700Ω	1	RCF472K	BTA-4700	Horiz. Feedback
R58	27KΩ	½	RCC273K	BTS-27K	Voltage Divider
R59	100KΩ	½	RCC104K	BTS-100K	Horiz. Phase Det. Load
R60	100KΩ	½	RCC104K	BTS-100K	Horiz. Phase Det. Load
R61	4.7Meg 20%	½	RCC475M	BTS-4.7Meg	Horiz. Phase Det. Load
R62	470KΩ 20%	½	RCC474M	BTS-470K	Horiz. AFC Filter
R63	1500Ω	½	RCC152M	BTS-1500	Horiz. MV Cathode
R64	150Ω 20%	½	RCC101M	BTS-150	Horiz. MV Cathode - See Note 8
R65	3900Ω	½	RCC392K	BTS-3900	Horiz. MV Plate
R66	100KΩ	½	RCC104K	BTS-100K	Horiz. MV Grid
R67	270KΩ	½	RCC274K	BTS-270K	Horiz. MV Plate
R68	4700Ω 20%	½	RCC472M	BTS-4700	Horiz. Peaking
R69	47Ω 5%	½	RCC470M		Parasitic Suppressor
R70	470KΩ 20%	½	RCC474M	BTS-470K	Horiz. Output Grid
R71	10KΩ 20%	2	RCG103M	BTB-10K	Horiz. Output Screen
R72	3.3Ω	½	RCC033K		HV Rectifier Filament
R73	680KΩ	1	RCF684M		HV Filter
R74A	9000Ω	10	RWT402K		Filter - Wire Wound
B	9000Ω	10			Filter - Wire Wound
R75	220KΩ	½	RCC-224M	BTS-220K	Isolation - See Note 8

Note 1. Some Models use a 10KΩ Resistor in this application
Note 2. Some Models use a 56Ω Resistor in this application
Note 3. Some Models use a 100Ω Resistor in this application
Note 4. Some Models use a 8200Ω Resistor in this application
Note 5. Some Models use a 22KΩ Resistor in this application
Note 6. Some Models use a 82Ω Resistor in this application
Note 7. Some Models use a 6800Ω Resistor in this application
Note 8. Not used in all Models
Note 9. Some Models use a 270KΩ Resistor in this application
Note 10. Some Models use a 10Meg Resistor in this application
† Items R43A, R43B, C44A, C44B, C44C are combined in one unit
● Items R49A, R49B, R49C, C46A, C46B, C46C are combined in one unit

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @1.7A	800VCT @.200ADC	5VAC @3A	6.3VAC @7.1A	B-1650-13	P-8163 ①	P-3070	TP-370
				SEC. 4 6.3VAC @1.2A				

① Drill new Mtg. Holes

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	385Ω Tap④ 29Ω	11.6Ω Tap② .6Ω, 7.5Ω	B1675-13A B1676-13A ③			HV0-7	Horiz. Output Trans.
T3	800Ω	12Ω	B1652-13 A1652-13 ④	A-8112	A-3036	TS0-5 ②	Vert. Output Trans.
T4A	10Ω		B-1452-9C	DY8	MDF-70		Horiz. Deflection Coils
B	52Ω		B-1452-9 ⑤				Vert. Deflection Coils

② Drill one new Mtg. Hole
③ Alternate Horiz. Output Trans.
④ Alternate Vert. Output Trans.
⑤ Alternate Deflection Yoke

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T5	5.2KΩ	3.1Ω	550Ω	.5Ω	A-1654-13 B-1653-13 ⑥	A-3823	A-3019	RO-303	

⑥ Alternate Audio Output Trans.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: JACKSON PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1A	P.M.	3.1Ω		ST-108 Mod. P6-X		
	CONE DIA.	V. C. DIA.				
SP1B	6"	9/16"				

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ↶)	JACKSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.200A	55Ω	2.2Henries	A-1651-13 A-1651-10 ②	C-2325	C-2974 ①	TR-4200 ①	① Drill one new Mtg. Hole. ② Alternate Filter

① Alternate Filter Choke

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	JACKSON PART No.	MERIT PART No.	
L2	Ant. Coil	0Ω				
L3	Fil. Choke	0Ω				
L4	RF, Mixer Grid & Osc. Coils	0Ω				
L5	Fil. Choke	0Ω				
L6	1st. Video IF	.8Ω				
L7	Fil. Choke	0Ω		A-1481-10		
L8	2nd. Video IF	.1Ω		A-1475-10	TV-102	
L9	Fil. Choke	0Ω		A-1481-10		
L10	3rd. Video IF	.3Ω	.3Ω	A-1476-10		
L11	4th. VideoIF	.3Ω	.3Ω	A-1476-10		
L12	Peaking Coil	5Ω		A-1482-10		120 Microhenries
L13	Peaking Coil	13.8Ω		A-1485-10	TV-188	600 Microhenries
L14	Peaking Coil	6.8Ω		A-1483-10	*TV-185	240 Microhenries, wound on 18KΩ Resistor
L15	Peaking Coil	9.5Ω		A-1484-10	TV-188	380 Microhenries
L16	Sound IF	2.4Ω		A-1477-10		
L17	Ratio Det.	4Ω	.1Ω	A-1478-10	TV-110	Tap ⓐ .5Ω
L18	Horiz. Osc.	49Ω		A-1479-10	TV-163	
L19	Width Coil	.25Ω		A-1486-10	MWC-2	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			JACKSON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	MTH	5A. 250V.	A-3751-30		312005 (3AG)	342001	MTH5	HKP
M2	AGC	1/4A. 250V.	A-3750-30		312.250 (3AG)	357001	AGC 1/4	4405

MISCELLANEOUS

ITEM No.	PART NAME	JACKSON PART No.	NOTES
M3	RF Tuner	B-4100-33	
M4	Focus Magnet	B-4101-33	
M5	Ion Trap	B-4102-33	
B1	Trimmer	CVM501ST	Horiz. Drive (50-500MMF)

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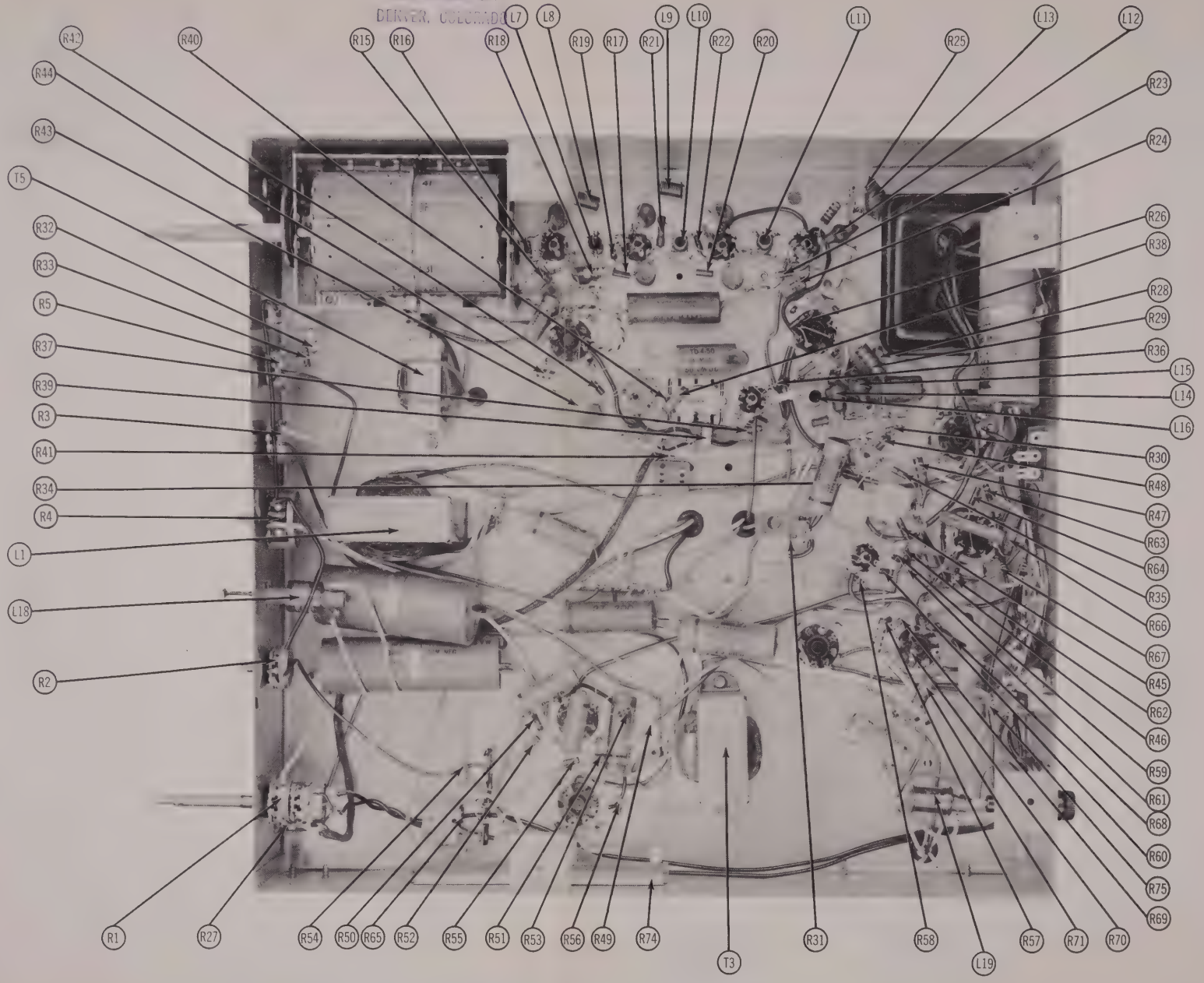

CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

MOTOROLA MODELS 17F12, A, B, BA, 17K12, A, B, BA, W, WA, 17T7, A, 17T8, A, B, BA

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 17F12A

MOTOROLA MODELS 17F12, A, B, BA, 17K12, A, B, BA, W, WA, 17T7, A, 17T8, A, B, BA

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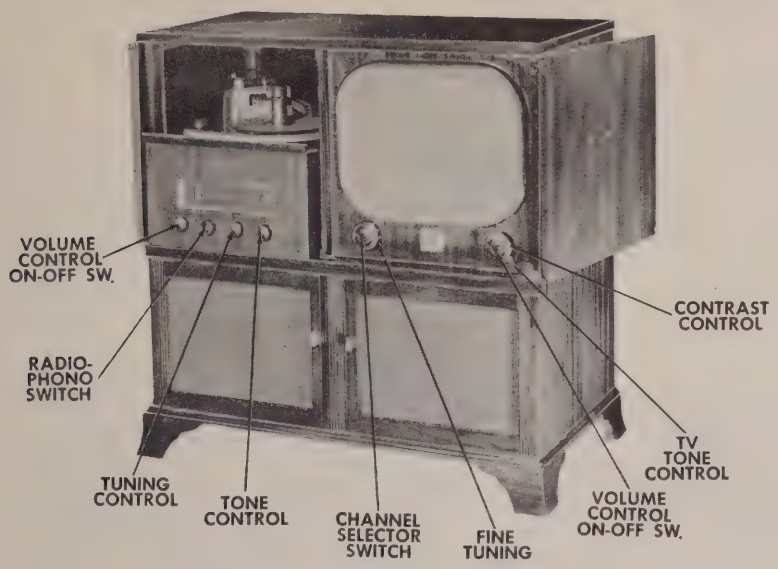
DATE 6-52 SET 171 FOLDER 8

PHOTOFACT* Folder

*TRADE MARK

MOTOROLA MODELS 17F12, A, B, BA, 17K12, A, B, BA, W, WA, 17T7, A, 17T8, A, B, BA



MOTOROLA 17F12A

TRADE NAME	MOTOROLA MODELS	TV CHASSIS	RADIO CHASSIS
	17F12, B	TS-325, A	HS-319
	17F12A, BA	TS-326, A	HS-319
	17K12	TS-325, A	
	17K12A	TS-326, A	
	17K12B	TS-325, A	
	17K12BA	TS-326, A	
	17K12W	TS-325, A	
	17K12WA	TS-326, A	
	17T7	TS-325, A	
	17T7A	TS-326, A	
	17T8	TS-325, A	
	17T8A	TS-326, A	
	17T8B	TS-325, A	
	17T8BA	TS-326, A	

MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Ill.	
TYPE SET	TV-AM-Phono Combination	
TUBES	Twenty Three	
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.3Amp. @ 117AC (TV) .56 Amp. @ 117 Volts AC (Radio)
TUNING RANGE	Channel 2 thru 13 (TV) 535-1620KC (AM)	

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FOR SERVICE INFORMATION ON RECORD CHANGER MOTOROLA MODEL RC-40, SEE MODEL RC-37 PHOTOFACT SET 141 FOLDER 8.

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DATE 6-52 SET 171 FOLDER 8

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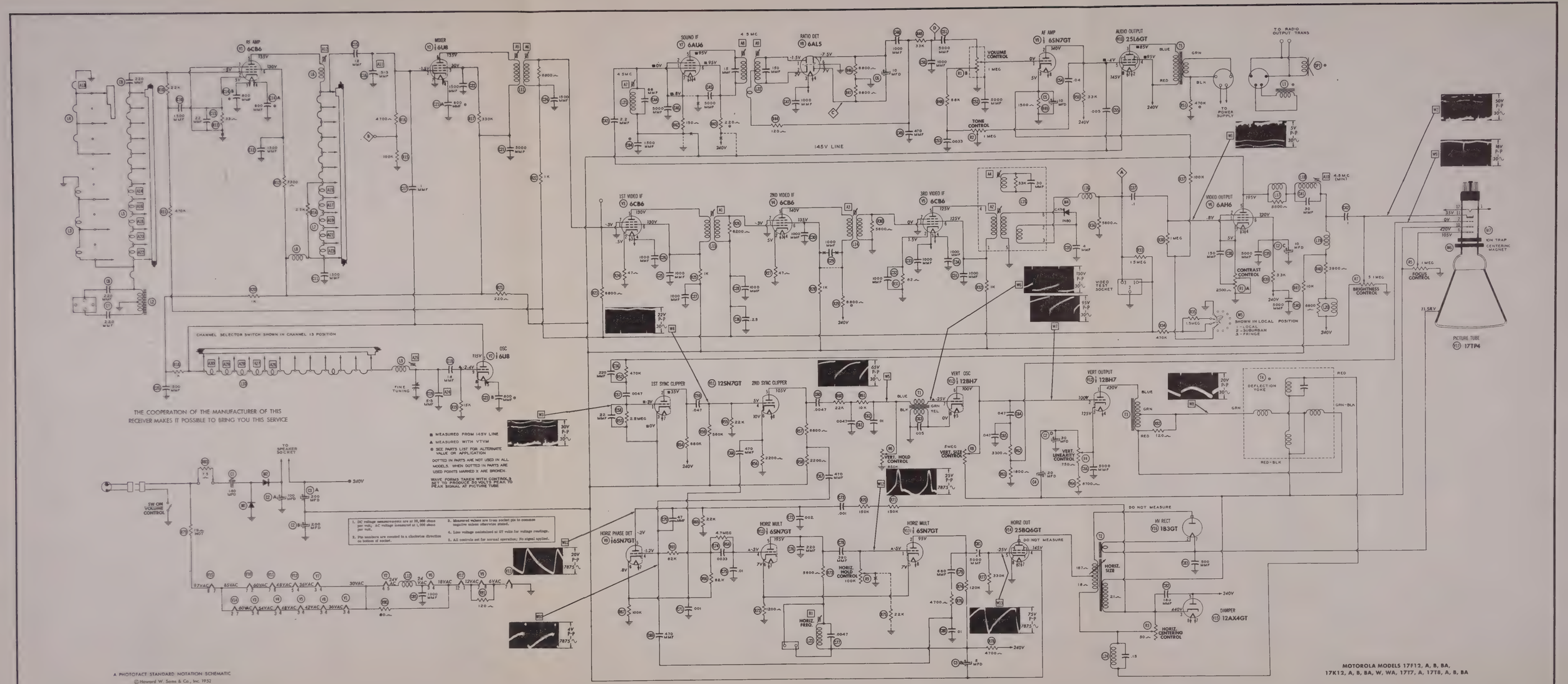
RF AMP
6CB6
MIXER
6U8
SOUND IF
6AU6
RATIO DET
6AL5
AF AMP
6SN7GT
AUDIO OUTPUT
25L6GT
TO RADIO OUTPUT TRANS
VOLUME CONTROL
1 MEG
TONE CONTROL
1 MEG
TO POWER SUPPLY
145V LINE
1ST VIDEO IF
6CB6
2ND VIDEO IF
6CB6
3RD VIDEO IF
6CB6
VIDEO OUTPUT
6AH6
4.5 M.C TRAP
4.5 M.C (MINT)
CONTRAST CONTROL
VIDEO TEST SOCKET
BRIGHTNESS CONTROL
FOCUS CONTROL
ION TRAP CENTERING MAGNET
PICTURE TUBE
17TP4
SHOWN IN LOCAL POSITION
1 - LOCAL
2 - SUBURBAN
3 - FRINGE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
OSC
6U8
FINE TUNING
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
■ MEASURED FROM 145V LINE.
▲ MEASURED WITH VTVM
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1ST SYNC CLIPPER
12SN7GT
2ND SYNC CLIPPER
VERT OSC
12BH7
VERT OUTPUT
12BH7
VERT. HOLD CONTROL
VERT. SIZE CONTROL
VERT. LINEARITY CONTROL
DEFLECTION YOKE
HORIZ PHASE DET
6SN7GT
HORIZ OSC
6SN7GT
HORIZ MULT
6SN7GT
HORIZ OUT
25BQ6GT
DO NOT MEASURE
HV RECT
1B3GT
HORIZ. HOLD CONTROL
HORIZ. FREQ.
HORIZ. SIZE
HORIZ. CENTERING CONTROL
DAMPER
12AX4GT
TO SPEAKER SOCKET
SW ON VOLUME CONTROL
1. DC voltage measurements are at 30,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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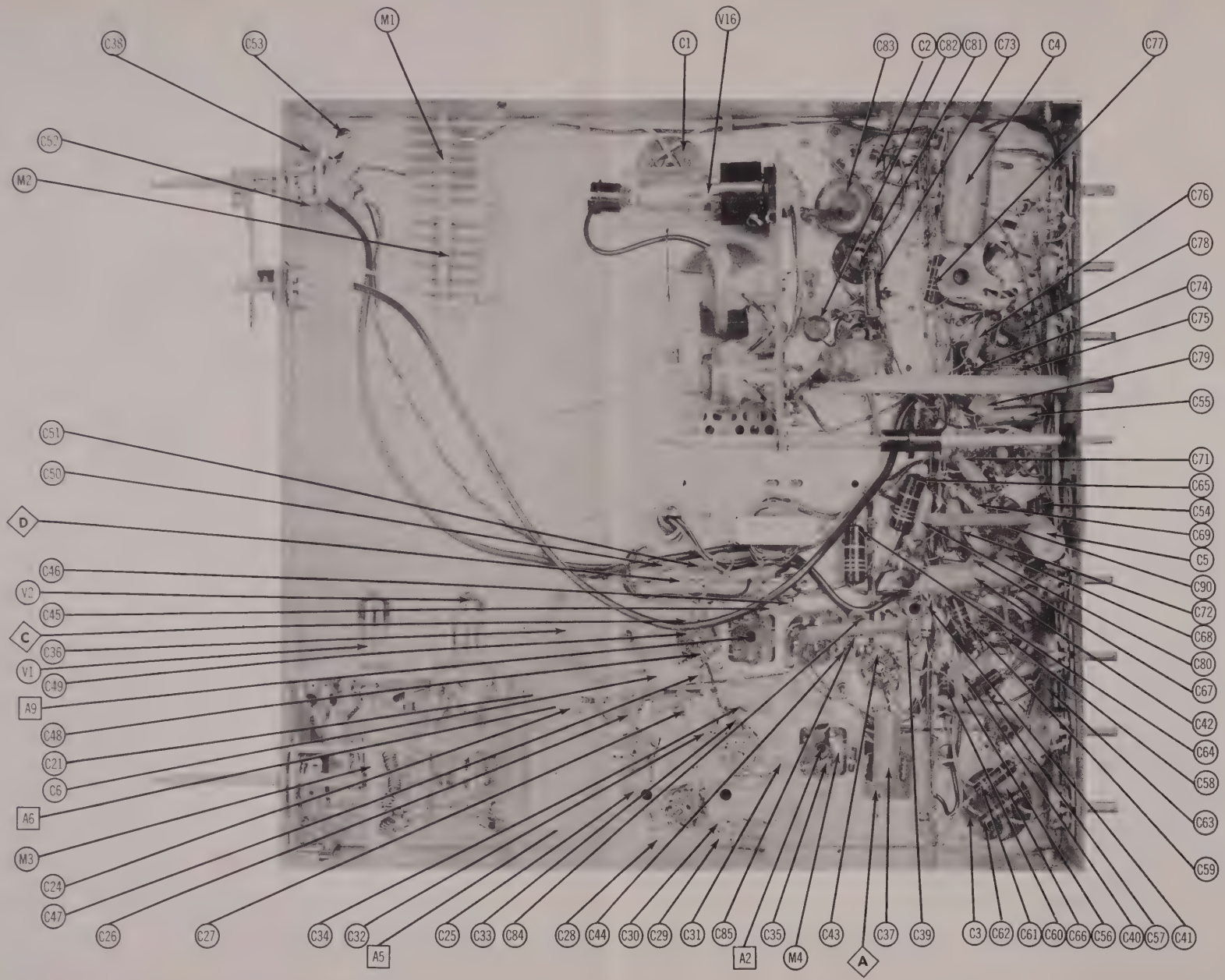
MOTOROLA MODELS 17F12, A, B, BA,
17K12, A, B, BA, W, WA, 17T7, A, 17T8, A, B, BA

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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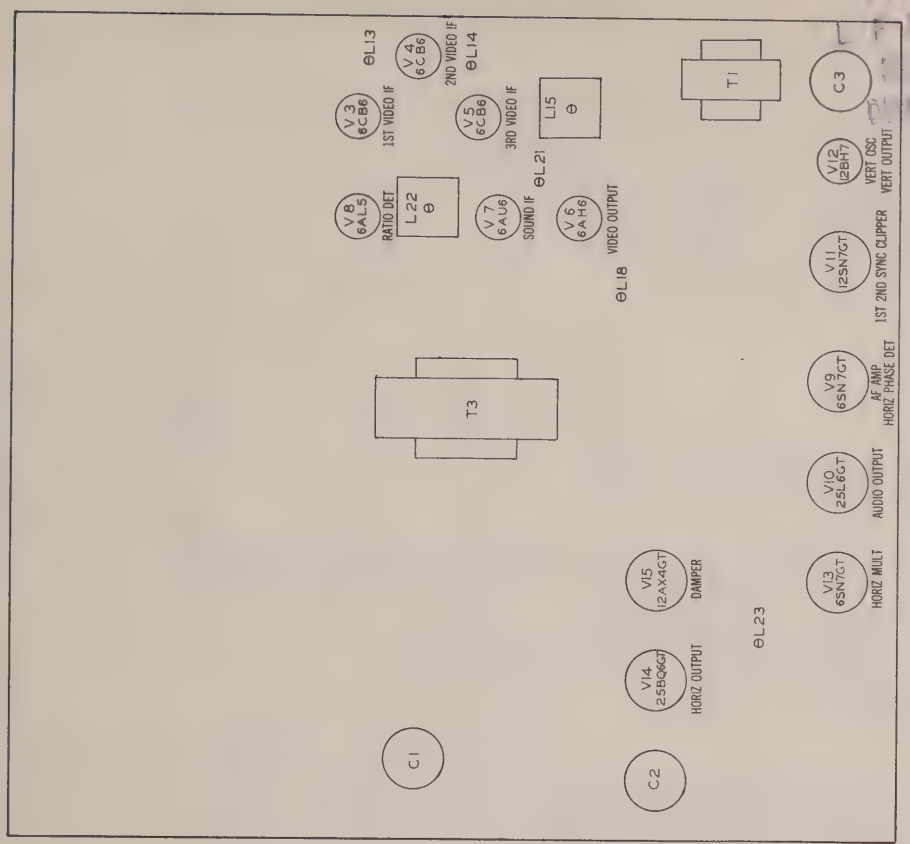
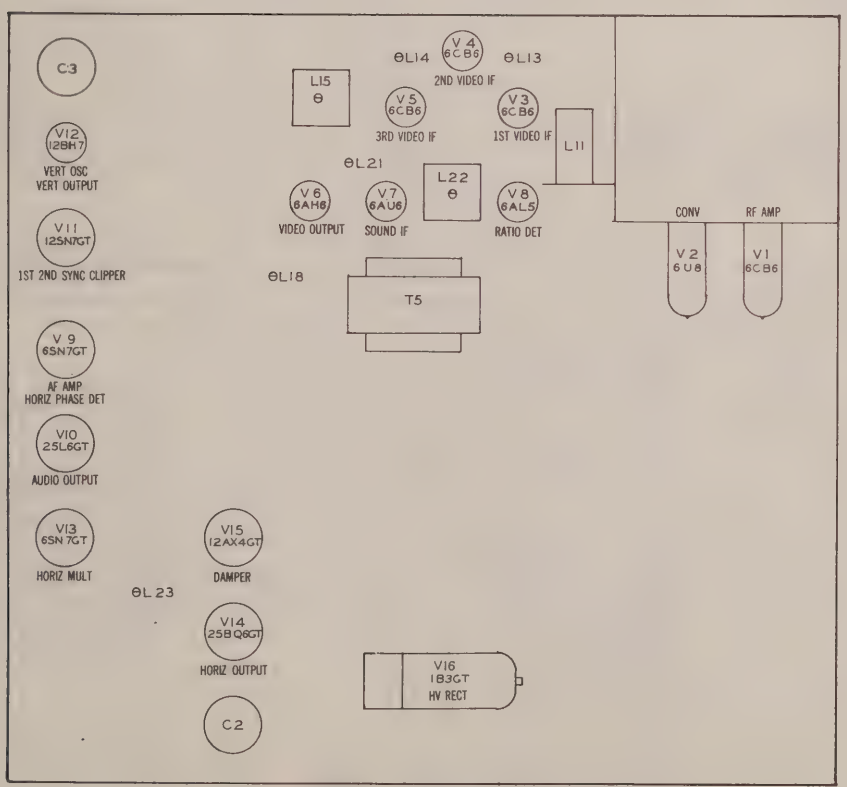


TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

MOTOROLA MODELS 17F12, A, B, BA, 17K12, A, B, BA, W, WA, 17T7, A, 17T8, A, B, BA

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Remove the horizontal output tube, V14, from its socket to eliminate RF interference in the oscilloscope. Connect an 80 ohm, 10 watt resistor across pins 2 and 7 of the socket, or use a similar tube with all pins clipped except the heaters. If alignment is to be done with picture tube remove, connect a short across pins 1 and 12 of the picture tube socket to complete the heater circuit.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery through a 47KΩ decoupling resistor to the ungrounded side of C36.
Connect the positive lead to chassis. Turn the Area Selector Switch on rear of chassis to "Local".
If interference due to the local oscillator is experienced during the video IF alignment it may be necessary to disable the oscillator circuit by means of a short across that section of the bandswitch (position 2 to 13).
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1, (grid) of 6CB6 (V3). Low side to chassis.	24.6MC (10MC swp.)	26.6MC	Any	Vert. amp. thru 47KΩ to Point A. Low side to chassis.	A1, A2	Adjust A1 to place the 26.6MC markers on high side of response curve at 50% of response. At the same time adjust A2 to provide a symmetrical top to the response curve. See Fig. 1
2.	"	"	"	22.9MC	"	"	A3	Adjust to place 22.9MC marker at 50% on low side of response curve, Fig. 1. At the same time adjust A2 as before.
3.	"	"	"	21.9MC	"	"	A4	Adjust for maximum attenuation of response at 21.9MC as per Fig. 1.
4.	"	High side to Point B. Low side to chassis.	"	22.9MC 26.4MC	"	"	A5, A6	Connect a short across R16. Adjust for response curve as per Fig. 2 with 22.9MC between 35 and 50% response and 26.4MC between 40 and 50% response. Make sure the slugs are tuned away from the center of the coil.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Set contrast control to fully clockwise position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.001MFD	High side to pin 1 (grid) of 6AH6 (V6). Low side to chassis.	4.5MC (unmod.)	Any	DC probe to Point C. Common to chassis.	A7, A8	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to Point D. Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Set contrast control to fully clockwise position.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.001MFD	High side to pin 1 (grid) of 6AH6 (V6). Low side to chassis.	4.5MC (450 KC Swp)	4.5 MC	Any	Vert. amp. to point C. Low side to chassis.	A7, A8	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry of response curve as per fig. 3.
6.	"	"	"	"	"	Vert. amp. to point D. Low side to chassis.	A9	Reconnect capacitor C6. Adjust so 4.5MC occurs at center of crossover lines as per fig. 4. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (grid) of 6AH6 (V6). Low side to chassis.	4.5MC (unmod.)	Any	DC probe thru crystal diode detector (fig. 5) to pin 11 of picture tube. Common to chassis.	A10	Adjust for MINIMUM deflection.

RF ALIGNMENT

Disable the local oscillator by connecting a short across the oscillator inductance. Remove the bias battery used in Video IF Alignment and connect a short across C36.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	177 MC (110MC Swp)	175.25 MC 179.75 MC	7	Vert. anmp. thru 47KΩ to point B. Low side to chassis.	A11	Set A12 to the mid-position of its range. Adjust A11 to place the video and sound markers on response curve as per fig. 6.
9.	"	"	213 MC (10 MC Swp)	211.25MC 215.75 MC	13	"	A12	Adjust to place the video and sound markers on response curve as per fig. 5. Recheck channel 7 and readjust A11 if necessary.
10.	"	"	207 MC (10MC Swp)	205.25 MC 209.75 MC	12	"	A13	Check all high band channels for response curve as per fig. 6. The peak of the curve may be sharpened or broadened by changing the position of the grounded end of A13. It should be approximately 3/16 inch from the switch shield. If the response is checked with the cover on the tuner the video marker will move down the left side of the curve a short distance, but should be within tolerance.
			201 MC (10 MC Swp)	199.25 MC 203.75 MC	11			
			195 MC (10 MC Swp)	193.25 MC 197.75 MC	10			
			189 MC (10 MC Swp)	187.25 MC 191.75 MC	9			
			183 MC (10 MC Swp)	181.25 MC 185.75 MC	8			
			177 MC (10 MC Swp)	175.25 MC 179.75 MC	7			
11.	"	"	85 MC (10 MC Swp)	83.25 MC 87.75 MC	6	"	A14, A15	Compress or expand coils for response curve as per fig. 7. Coils with even "A" numbers affect the video carrier and coils with odd "A" numbers affect the sound carrier.
			79 MC (10 MC Swp)	77.25 MC 81.75 MC	5		A16, A17	
			69 MC (10 MC Swp)	67.25 MC 71.75 MC	4		A18, A19	
			63 MC (10 MC Swp)	61.25 MC 65.75 MC	3		A20, A21	
			57 MC (10 MC Swp)	55.25 MC 59.75 MC	2		A22, A23	

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TV ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the short from the oscillator inductance.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195 MC	197.75 MC	10	Vert. Amp. thru 470KΩ to point (A) Low side to chassis.	A24	Set fine tuning trimmer to mid-capacity. Adjust A24 to place sound marker slightly higher in frequency than the 21.9 MC trap notch, fig. 2. This allowance is made to compensate for bottom shield being off.
13.	"	"	213 MC (10 MC Swp)	215.75 MC	13	"		Check all high band channels for sound marker slightly higher in frequency than 21.9 MC trap notch with fine tuning trimmer not more than 30 degrees from mid-position. If necessary compress or expand A25 for proper marker placement, then recheck channel 10 as in step 12.
			207 MC (10 MC Swp)	209.75 MC	12			
			201 MC (10 MC Swp)	203.75 MC	11			
			189 MC (10 MC Swp)	191.75 MC	9			
			183 MC (10 MC Swp)	185.75 MC	8			
			177 MC (10 MC Swp)	179.75 MC	7			
14.	"	"	85 MC (10 MC Swp)	87.75 MC	6	"	A26	Set fine tuning trimmer to 30 degrees from mid-capacity position. Compress or expand A26 to place sound marker slightly higher in frequency than 21.9 MC trap notch.
15.	"	"	79 MC (10 MC Swp)	81.75 MC	5	"	A27	Compress or expand coils to place sound marker slightly higher in frequency than 21.9 MC trap notch, with not more than 15 degree variation of fine tuning trimmer from position of step 14.
			69 MC (10 MC Swp)	71.75 MC	4		A28	
			63 MC (10 MC Swp)	65.75 MC	3		A29	
			57 MC (10 MC Swp)	59.75 MC	2		A30	

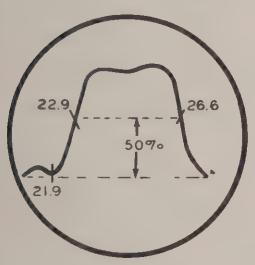


FIG.1

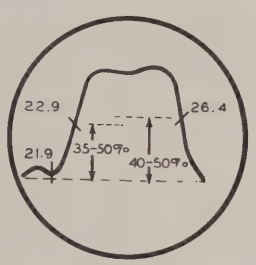


FIG.2

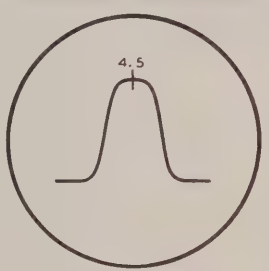


FIG. 3

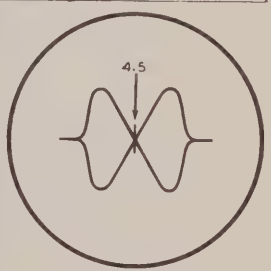


FIG. 4

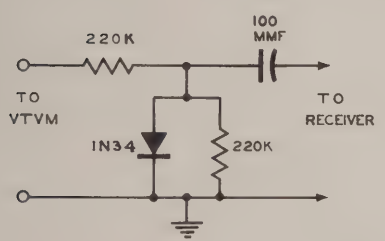


FIG.5

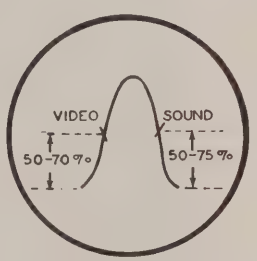


FIG.6

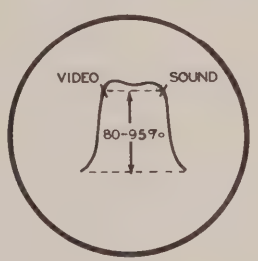


FIG.7

RADIO ALIGNMENT INSTRUCTIONS

AM RADIO ALIGNMENT

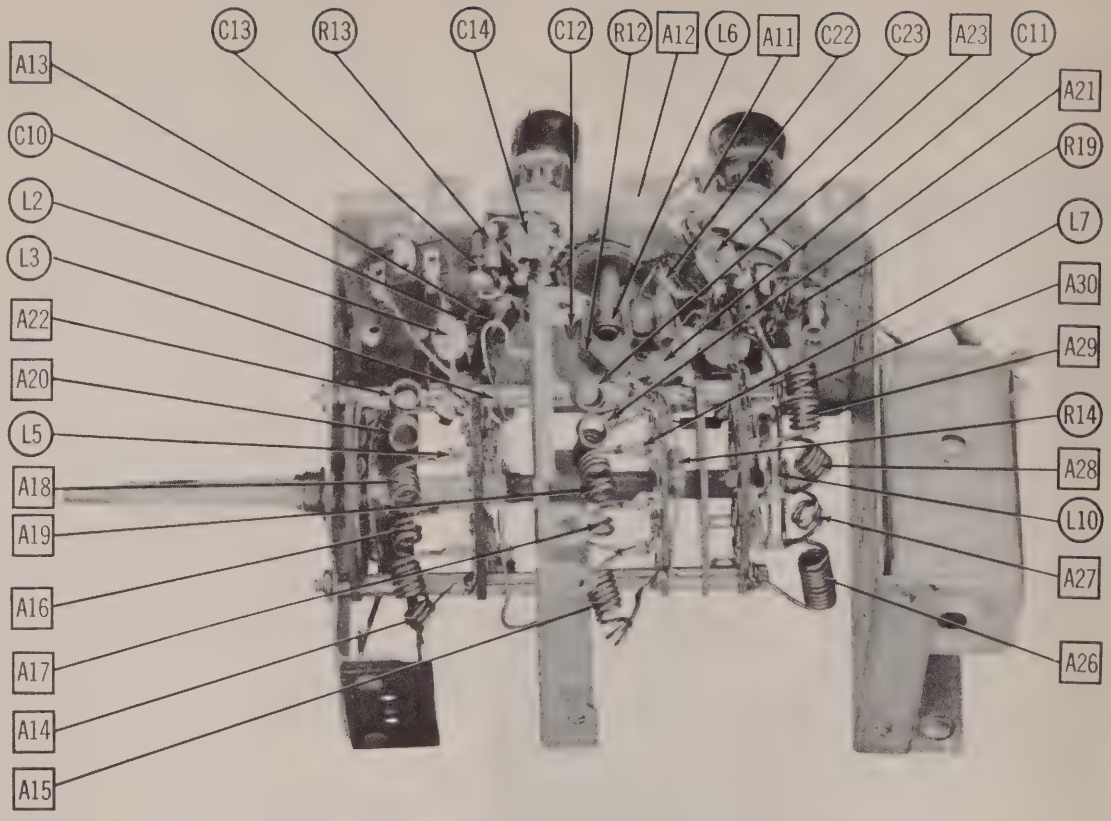
Turn the tuning gang fully open and set pointer to coincide with the right hand side of the "0" in 160.
Set "Phono"-Radio" knob to "Radio".
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
16.	.1MFD	High side to pin 7 (grid) of 6BE6 (V19). Low side to chassis.	455 KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil.	A31, A32 A33, A34.	Adjust for maximum output.
17.	"	"	1620 KC	"	"	"	A35	Adjust A35 for maximum output. If unable to peak A35, adjust A36 to ½ turn from fully closed then readjust A35.
18.		Loop	1400 KC	"	Tune to 1400 KC Signal	"	A37	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
19.	.1MFD	High side to pin 7 (grid) of 6BE6 (V19)	535 KC	"	Tuning gang fully closed.	"	A38	If receiver has been found to be badly off calibration after step 18, perform step 19 adjusting A38 for maximum output. Repeat Step 17.

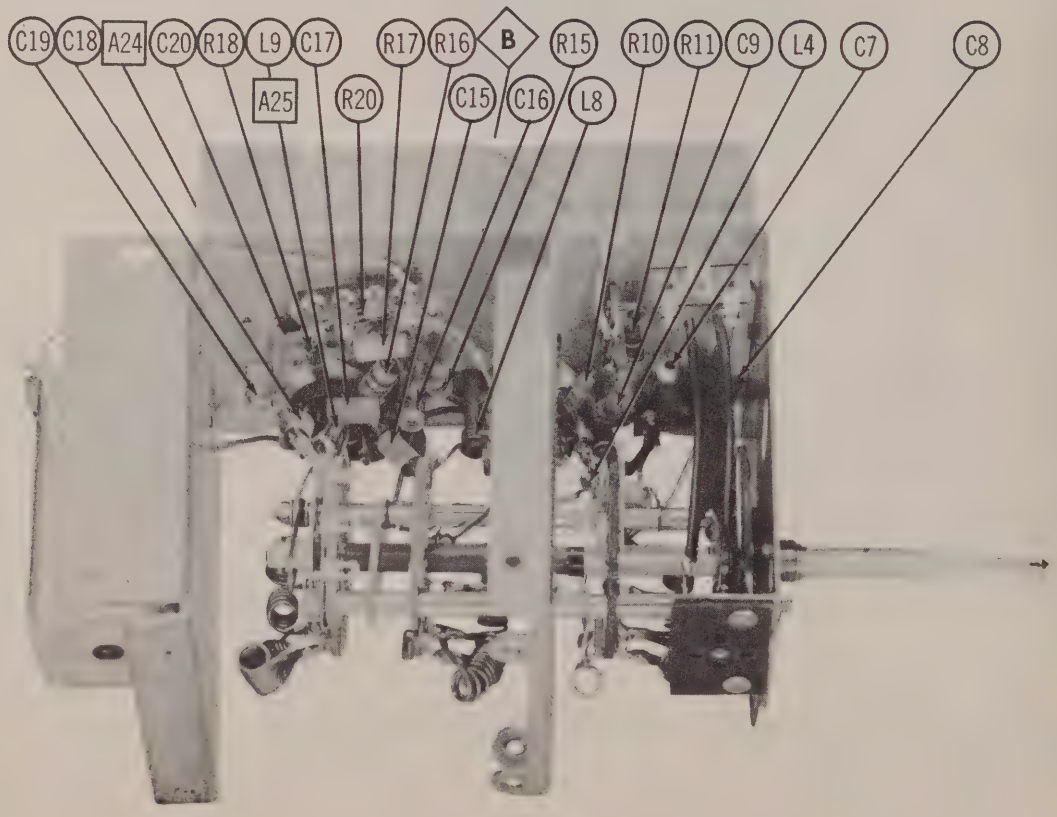
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2Meg	33Ω	11Ω	8.2Ω	■220Ω	■3.5KΩ	0Ω		
V 2	6U8	■2.2KΩ	100KΩ	■330KΩ	8.2Ω	6.8Ω	■220Ω	0Ω	0Ω	15KΩ
V 3	6CB6	1.5Meg	47Ω	20Ω	18Ω	■1KΩ	■1KΩ	0Ω		
V 4	6CB6	1.5Meg	47Ω	18Ω	16Ω	†6.8KΩ	■1KΩ	0Ω		
V 5	6CB6	.3Ω	82Ω	16Ω	14Ω	■1KΩ	■1KΩ	0Ω		
V 6	6AH6	1.1Meg	450Ω	6.8Ω	4.7Ω	†3.3KΩ	†33KΩ	450Ω		
V 7	6AU6	■1.1Ω	■150Ω	11Ω	8.2Ω	†275Ω	†275Ω	■150Ω		
V 8	6AL5	INF	INF	14Ω	11Ω	6.8KΩ	0Ω	6.8KΩ		
V 9	6SN7GT	250KΩ	†33KΩ	1.5KΩ	265KΩ	22KΩ	100KΩ	3.2Ω	1.6Ω	
V 10	25L6GT	150Ω	19Ω	†265Ω	†55Ω	†33KΩ	180KΩ	23Ω	70KΩ	
V 11	12SN7GT	■2.2Meg	†680KΩ	■0Ω	22KΩ	■9KΩ	2.2KΩ	19Ω	16Ω	
V 12	12BH7	#730Ω	#2.8Meg	9KΩ	11Ω	16Ω	#2.8Meg	580KΩ	50Ω	13Ω
V 13	6SN7GT	80KΩ	†120KΩ	1.2KΩ	4.8Meg	†10KΩ	1.2KΩ	1.6Ω	0Ω	
V 14	25BQ6GT	INF	23Ω	†120KΩ	■0Ω	330KΩ	22KΩ	20Ω	0Ω	TOP CAP #41Ω
V 15	12AX4GT	INF	#26Ω	1Meg	INF	†55Ω	#300KΩ	23Ω	26Ω	
V 16	1B3GT	PINS 1 THRU 8 HAVE INF RESISTANCE								TOP CAP #200Ω
V 17	17TP4	3.2Ω	1.8KΩ	PIN 6 200KΩ	PIN 10 #21Ω	PIN 11 260KΩ	PIN 12 4.7Ω			

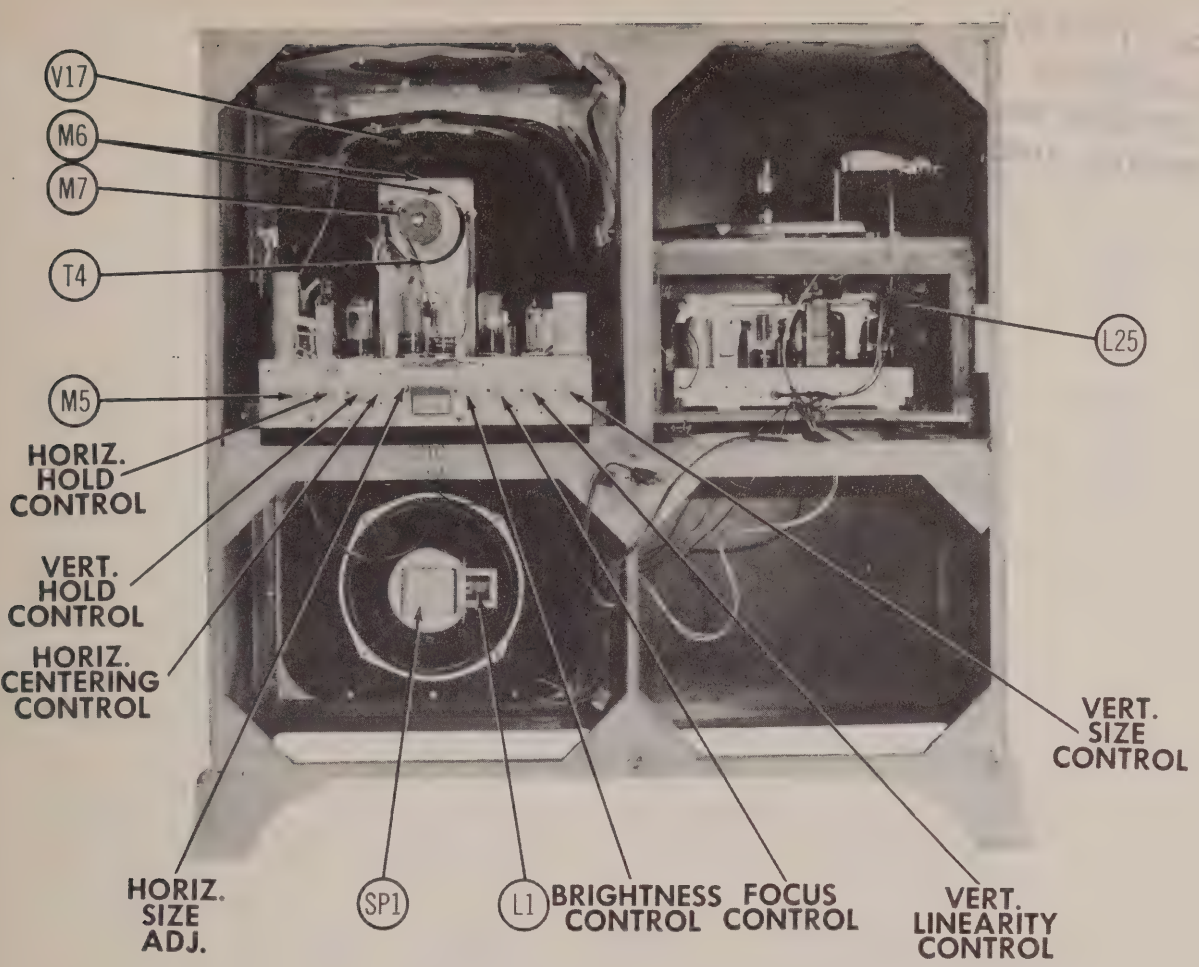
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
M5 IN LOCAL POSITION
† MEASURED FROM OUTPUT OF M2
# MEASURED FROM PIN 3 OF V15
■ MEASURED FROM 145 VDC LINE



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

The horizontal hold control should have a sync range of approximately 70 degrees. If the control is too critical adjust as follows:

1. Connect a .25MFD capacitor from the junction R73 and L23 (horizontal oscillator coil) to chassis.

2. Using the horizontal centering control move the picture to the left, so the right edge of the raster can be seen. Adjust the horizontal hold control for about a quarter inch of blanking pulse, which appears as a gray bar at the right edge of the raster.

3. Remove the .25MFD capacitor and adjust the horizontal oscillator slug (B1) for the same amount of blanking pulse as was seen in step 2.

This adjustment also affects the vertical size so it may be found necessary to adjust the vertical size control.

DISASSEMBLY INSTRUCTIONS

TV

1. Remove 4 push on type control knobs and 1 push on type lever from front panel.

2. Remove 5 wood screws and 1 metal screw, disconnect AC plug to TV. Remove rear cover.

3. Disconnect built-in antenna, TV speaker plug.

4. Remove 2 wood screws. Remove antenna bracket.

5. Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS: AS OUTLINED ABOVE.

RADIO

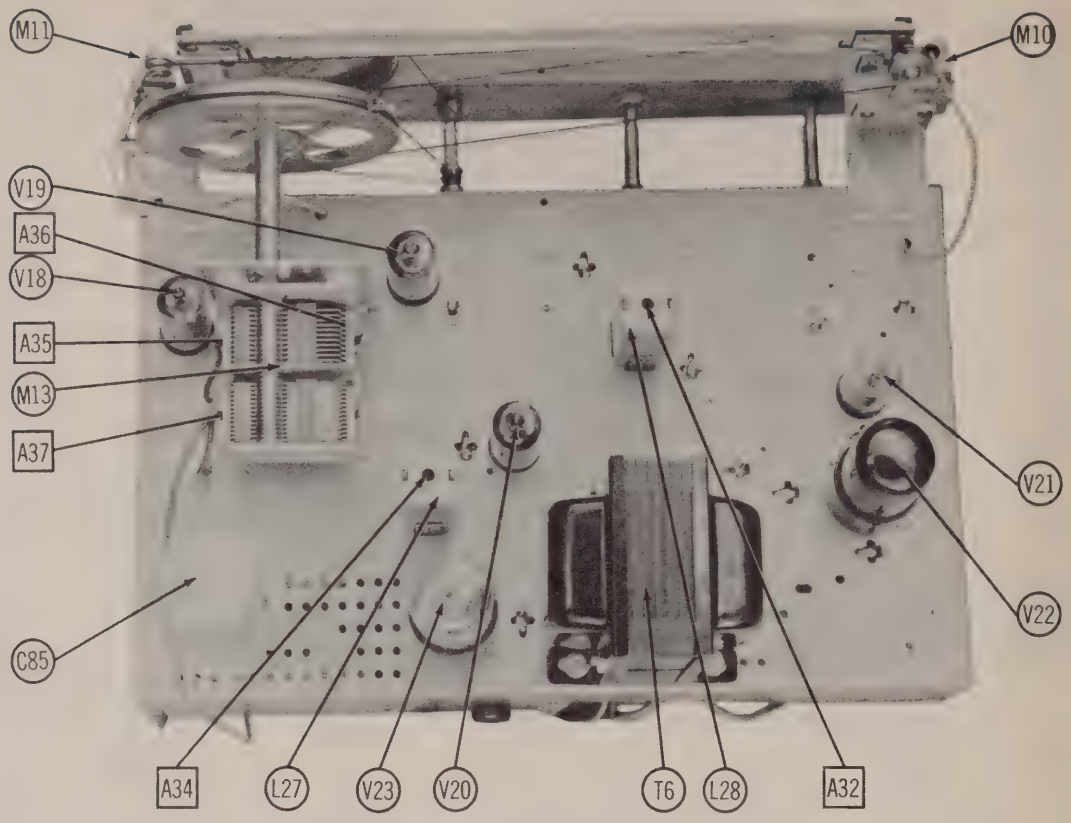
1. Remove 4 push on type control knobs from front panel.

2. Remove 10 wood screws. Remove rear cover.

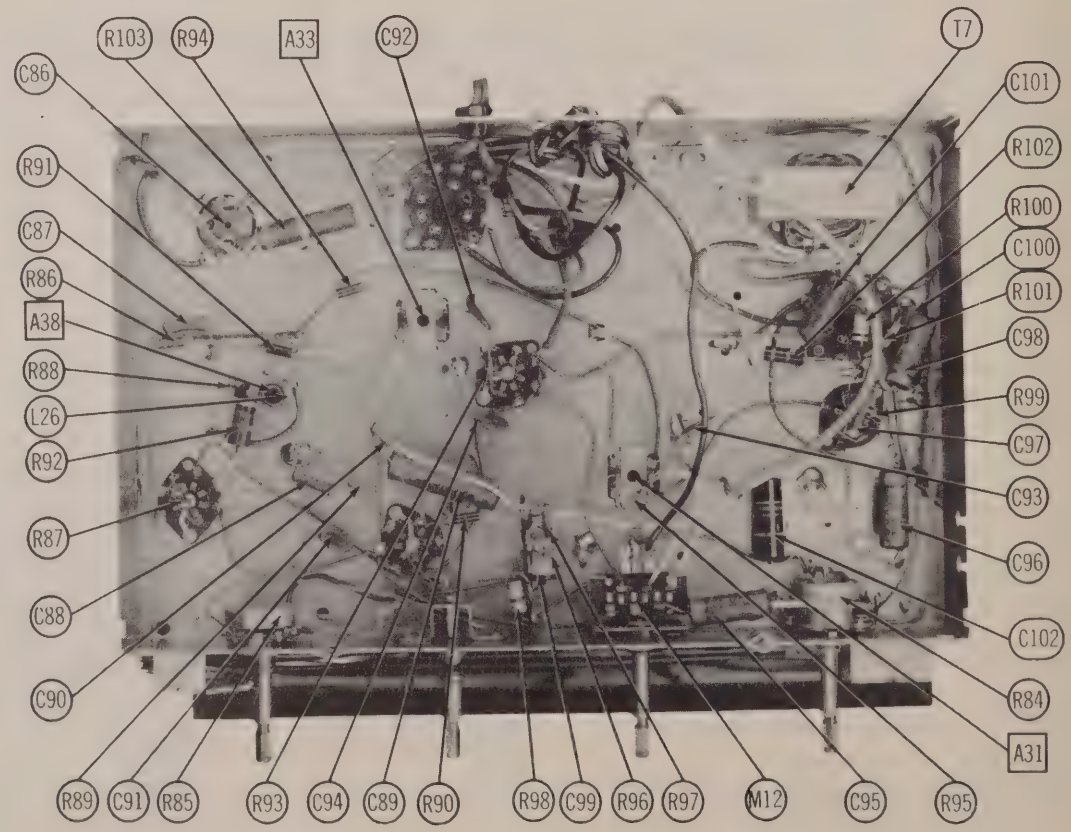
3. Disconnect phono audio cable, phono motor cable, antenna leads and speaker.

4. Remove 4 nuts holding speaker. Remove speaker.

5. Remove 3 chassis bolts. Remove chassis.



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6CB6	6CB6	7CH	
V2	Converter	6U8	6U8	9AE	
V3	1st. Video IF Amp.	6CB6	6CB6	7CH	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CH	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CH	
V6	Video Output	6AH6	6AH6	7BK	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier – Horiz. Phase Det.	6SN7GT	6SN7GT	8BD	
V10	Audio Output	25L6GT	25L6GT	7AC	
V11	1st. & 2nd. Sync. Clippers	12SN7GT	12SN7GT	8BD	
V12	Vert. Oscillator – Vert. Output	12BH7	12BH7	9A	
V13	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V14	Horiz. Output	25BQ6GT	25BQ6GT	6AM	
V15	Damper	12AX4GT	12AX4GT	4CG	
V16	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	MOTOROLA PART No.	SYLVANIA PART No.			
V17A	17TP4	17TP4		12C	
V17B	17HP4A			12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	140	150	23B484097	E3A120		UPE15015		TVL-1428	Voltage Doubler
C2A	100	300	23B712068	E4D491		UPT436		TVL-4561	▪ Filter
B	200	150							▲ Decoupling
C	10	300							■ Video Output Screen
D	30	150							Vert. Output Cathode
C3A	200	150	23B710941	E4B257		UP3101015		TVL-1431	▪ Filter
B	5	150				BR415		TVA-1402	▲ Decoupling
C4	20	450	23K710667	PRS450/20		BR2045		TVA-1709	Decoupling
C5	10	50	23A90205	PRS50/10		BR105		TVA-1304	AF Amp. Cathode Bypass
C6	10	50	23A90205	PRS50/10		BR105		TVA-1304	Stabilizing Cap.
C7	220		21K77375	SI220	D6-221		GP2K-221	5GA-T22	RF Coupling
C8	220		21K77375	SI220	D6-221		GP2K-221	5GA-T22	RF Coupling
C9	220		21K400941	SI220	D6-221		GP2K-221	5GA-T22	RF Coupling
C10	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	AGC Filter
C11	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	RF Amp. Plate Dec.
C12	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	RF Amp. Screen Bypass
C13	22		21K400942	SI22	D6-220		GP1K-220	5GA-Q22	RF Amp. Cathode Bypass
C14A	800			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	RF Amp. Fil. Bypass †
B	800								RF Amp. Fil. Bypass †
C15	12		21K114073	SI12	D6-120		GP1K-120		RF Coupling
C16	.5-3		1X710954		829-3				Variable Trimmer
C17	1		21K114071		TCZ-1		NP0K-010		Osc. Coupling
C18	18		21K711246						Osc. Grid Cap.
C19	.5-3		1X710954		829-3				Variable Trimmer
C20	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	RF Bypass
C21	5000		21A470789	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Mixer Plate Dec.
C22	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	Mixer Screen Bypass
C23A	800			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	Conv. Fil. Bypass †
B	800								Conv. Fil. Bypass †
C24	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	AGC Filter
C25	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	1st. Video IF Dec.
C26	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	1st. Video IF Fil.
C27	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	RF Bypass
C28	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	AGC Filter
C29	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	2nd. Video IF Plate
C30	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	2nd. Video IF Screen
C31	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	3rd. Video IF Dec.
C32	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	3rd. Video IF Cathode
C33	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	3rd. Video IF Fil.
C34	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	3rd. Video IF Fil.
C35	4		21K38951				NP0K-040		Video Det. Filter
C36	.25	100	8R9810	P488-25		PJ2P25		2TM-P25	AGC Filter
C37	.1	100	8R9814	P288-1	DF-104	PJ2P1		2TM-P1	Video Coupling
C38	150		21K691948	SI150	D6-151	TM5T15	GP2K-151	5GA-T15	Video Output Cathode
C39	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Video Output Screen
C40	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C41	30		21K470329		TCZ-30		NP0K-300		Fixed Trimmer
C42	.1	400	8R9862	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C43	2.2		21A478274		TCZ-2.2		NP0K-2R2		Sound IF Coupling
C44	68		21R400928				N470L-680		Fixed Trimmer
C45	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Dec.
C46	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Cathode
C47	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	Ratio Det. Fil.
C48	1000		21K780599	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	Diode Load Cap.
C49	470		21K400940	SI470	D6-471	TM5T5	GP2K-471	5GA-T47	RF Bypass
C50	1000		21K780599	SI1000	D6-102	TM5D1	GP2L-102	5HK-D1	De-Emphasis
C51	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Audio Coupling
C52	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Volume Cont. Isolation
C53	.0033	400	8R490220	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Tone Comp.
C54	.04	600	8R490258	P688-04		PTE6S5		6TM-S4	Tone Comp.
C55	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Grid
C56	220		21K77375	SI220	D6-221	5R5T25	GP2K-221	5GA-T22	Sync. Coupling
C57	.0047	400	8R490249	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Sync. Coupling
C58	22		21K400942	SI22	D6-220		GP1K-220	5GA-Q22	Sync. Clipper Grid
C59	.047	400	8R490232	P488-047	DF-503	PTE4S47		4TM-S47	Sync. Coupling
C60	.0047	400	8R490222	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Vert. Sync. Coupling

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TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No	RATING CAP.	RATING VOLT	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C61	.0047	400	8R490222	P488-.0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Vert. Integrator Net.
C62	.01	400	8R490226	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. Integrator Net.
C63	.005	600	8R9869	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Fixed Trimmer
C64	.047	400	8R490232	P488-047	D6F-503	PTE4S47		4TM-S47	Vert. Discharge
C65	.047	400	8R490232	P488-047	D6F-503	PTE4S47		4TM-S47	Integrator Net.
C66	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Vert. Output Cathode
C67	470	500	21R6673	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sync. Coupling
C68	470	500	21R6673	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Sync. Coupling
C69	470	500	21R6673	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Horiz. Feedback
C70	47		21R114207	S147N750	TCN-47		N750K-470	5TCU-Q47	Horiz. Feedback
C71	.001	400	8R9866	P488-001	D6-102	PTE5D1	GP2L-103	6TM-D1	Voltage Divider
C72	.002	600	8R9867	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Voltage Divider
C73	.001	1000	8R490268	P1088-001		PTE16D1		MB-D1	Horiz. Feedback
C74	.0033	400	8R490220	P488-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Horiz. AFC Coupling
C75	.01	400	8R9858	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Horiz. AFC Filter
C76	220		21K77375	B1220	D6-221	5HS2S5	GP2K-221	5GA-T22	Horiz. MV Plate
C77	.0047	600	[illegible]	P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Fixed Trimmer
C78	390	500	21R114740	1469-0004		5HS7-4		MS-34	Horiz. MV Feedback
C79	680	500	21R114781	1479-0007		2R5T7		MS-37	Horiz. Discharge
C80	.01	600	[illegible]	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Voltage Divider
C81	5000		21R115312	BPD-005	DD-502	TM5D5	811-005	5HK-D5	Horiz. Sweep Coupling
C82	180	3000	21K701873						Damper Plate
C83	500	20000	21A790833	HV20C	TV3-502	MM-C20T5			HV Filter
C84	1500		21A701029	BPD-0015	DD-152	TM5D15	801-0015	5HK-D15	Sound IF Grid Dec. *
C85	1000		21K400936	BPD-001	DD-102	TM5D1	801-001	5HK-D1	Video Amp. Fil. Bypass

† Some models use dual 1000MMF in this application (Part #21K400937)
* Not used in all models

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2500Ω	½	18K702864				Contrast Control - Tapped ② 500Ω - Panel
B	1Meg	½					Volume Control - Tapped ② 300KΩ - Rear
R2A	1Meg	½	18A711999	Q11-137	AG-61-S		Tone Control
B	Shaft		Not Req.	PQ	RS-2		Attach to R1A per instructions
R3	50Ω	1	LX711613				Horiz. Centering Control - Wire Wound
R4A	750Ω	½	18A702475		AG-8-S		Vert. Linearity Control
B	Shaft		Not Req.		RS-2		Attach to R4A per instructions
R5A	1Meg	½	18A711225	Q11-137	AG-61-S	AN-69	Focus Control
B	Shaft		Not Req.	Not Req.	RS-2	AK-1	Attach to R5A per instructions
R6A	850KΩ	½	18K711278	Q11-137	AG-61-S		Vert. Hold Control - See Note 1
B	Shaft		Not Req.	Not Req.	RS-2		Attach to R6A per instructions
R7A	5.1Meg	½	18A702441		AG-85-S		Brightness Control - See Note 2
B	Shaft		Not Req.		RS-2		Attach to R7A per instructions
R8A	5Meg	½	18A702443	Q11-141	AG-85-S		Vert. Size Control - See Note 3
B	Shaft		Not Req.	Not Req.	RS-2		Attach to R8A per instructions
R9A	100KΩ	½	18A702468	Q11-128	AG-49-S		Horiz. Hold Control - See Note 4
B	Shaft		Not Req.	Not Req.	RS-2		Attach to R9A per instructions

Note 1. Connect a 350KΩ Resistor in series with clockwise terminal and ground
Note 2. Connect a 100KΩ Resistor in series with clockwise terminal and ground
Note 3. Connect a 1Meg Resistor in series with clockwise terminal and positive side of C4
Note 4. Connect a 40KΩ Resistor in series with clockwise terminal and Grid of V13

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R10	22KΩ	½	6R6397		RF Amp. Grid
R11	470KΩ 20%	½	6R6032	BTS-470K	AGC Network
R12	3300Ω 20%	½	6R6036	BTS-3300	RF Amp. Screen
R13	33Ω	½	6R2036		RF Amp. Cathode
R14	22KΩ	½	6R6397		RF Coil Shunt
R15	100KΩ	½	6R6075	BTS-100K	Mixer Grid
R16	4700Ω 20%	½	6R6039	BTS-4700	Mixer Grid
R17	330KΩ 20%	½	6R6014		Mixer Screen
R18	1000Ω 20%	½	6R6301	BTS-1000	Osc. Plate
R19	15KΩ 20%	½	6R2119	BTS-15K	Osc. Grid
R20	1000Ω 20%	½	6R6301	BTS-1000	Osc. Plate Decoupling
R21	220Ω 20%	½	6R3927	BTS-220	Decoupling
R22	1000Ω 20%	½	6R6301	BTS-1000	AGC Network
R23	6800Ω	½	6R6428	BTS-6800	1st. Video IF Coil Shunt
R24	47Ω	½	6R5550		1st. Video IF Amp. Cathode
R25	1000Ω	½	6R6301	BTS-1000	1st. Video IF Amp. Decoupling
R26	8200Ω	½			2nd. Video IF Coil Shunt
R27	47Ω	½	6R5550		2nd. Video IF Amp. Cathode
R28	1000Ω	½	6R6301	BTS-1000	2nd. Video IF Amp. Screen
R29	6800Ω	2			2nd. Video IF Amp. Plate Decoupling - See Note 1
R30	5600Ω	½	6R6117		3rd. Video IF Coil Shunt
R31	82Ω	½	6R2035	BTS-82	3rd. Video IF Amp. Cathode
R32	1000Ω	½	6R6301	BTS-1000	3rd. Video IF Amp. Decoupling
R33	1.5Meg	½	6R6460	BTS-1.5Meg	AGC Network
R34	470KΩ 20%	½	6R6032	BTS-470K	AGC Network
R35	1.5Meg 20%	½	6R3966	BTS-1.5Meg	AGC Network
R36	5600Ω	½	6R6117	BTS-5600	Video Det. Load
R37	100KΩ 20%	½	6R6075	BTS-100K	Bias Network
R38	1Meg	½	6R6046	BTS-1Meg	Video Output Grid
R39	33KΩ	1	6R401012	BTA-33K	Video Output Screen
R40	3900Ω	2	6R476012	BTB-3900	Video Output Plate
R41	10KΩ 20%	½	6R6054	BTS-10K	Isolation
R42	150Ω 20%	½	6R3992	BTS-150	Sound IF Amp. Cathode
R43	220Ω 20%	½	6R3927	BTS-220	Sound IF Amp. Decoupling - See Note 2
R44	120Ω	½	6R5551	BTS-120	Balancing
R45	33KΩ 20%	½	6R6012	BTS-33K	De-emphasis
R46	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R47	6800Ω	½	6R6428	BTS-6800	Ratio Det. Diode Load
R48	68KΩ 20%	½	6R6001	BTS-68K	Tone Compensation
R49	1500Ω	½	6R6038	BTS-1500	AF Amp. Cathode
R50	33KΩ	1	6R6400	BTA-33K	AF Amp. Plate
R51	470KΩ 20%	½	6R6032	BTS-470K	Isolation - See Note 3

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R52	470KΩ 20%	½	6R6032	BTS-470K	Isolation
R53	2.2Meg 20%	½	6R3927	BTS-2.2Meg	1st. Sync. Clipper Grid
R54	680KΩ	½	6R6475	BTS-680K	1st. Sync. Clipper Plate
R55	22KΩ	½	6R6028	BTS-22K	2nd. Sync. Clipper Grid
R56	2200Ω	½	6R6069	BTS-2200	2nd. Sync. Clipper Cathode
R57	6800Ω	½	6R6428	BTS-6800	2nd. Sync. Clipper Plate
R58	2200Ω	½	6R6069	BTS-2200	2nd. Sync. Clipper Plate
R59	560KΩ	½	6R5697	BTS-560K	Voltage Divider
R60	22KΩ	½	6R6028	BTS-22K	Integrator Network
R61	10KΩ	½	6R6054	BTS-10K	Integrator Network
R62	3300Ω	½	6R5581	BTS-3300	Vert. Peaking
R63	1800Ω	½	6R2089	BTS-1800	Vert. Peaking
R64	8700Ω	3	17K710950		Vert. Output Cathode - Wire Wound
R65	82KΩ	½	6R5644	BTS-82K	Horiz. Phase Det. Grid
R66	82KΩ	½	6R5644	BTS-82K	Horiz. Phase Det. Grid
R67	100KΩ	½	6R6031	BTS-100K	Horiz. AFC Filter
R68	4.7Meg 20%	½	6R2122	BTS-4.7Meg	Horiz. AFC Filter
R69	22KΩ	½	6R6028	BTS-22K	Horiz. Feedback
R70	150KΩ	1	6R410053	BTA-150K	Horiz. Feedback
R71	150KΩ	1	6R410053	BTA-150K	Horiz. Feedback
R72	1200Ω	1	6R6393	BTS-1200	Horiz. MV Cathode
R73	5600Ω	½	6R6117	BTS-5600	Horiz. MV Plate
R74	120KΩ	½	6R5631	BTS-120K	Horiz. MV Plate
R75	22KΩ	½	6R6028	BTS-22K	Voltage Divider
R76	4700Ω	½	6R6080	BTS-4700	Horiz. Peaking
R77	330KΩ	½	6R2096	BTS-330K	Horiz. Output Grid
R78	4700Ω	½	6R6080	BTS-4700	Decoupling
R79	*	5%	17K711561		Filament Dropping - Wire Wound
R80	80Ω	10	17K711224	1 3/4A-75	Fila ment Dropping - Wire Wound
R81	120Ω	10	17K712038	1 3/4A-125	Filament Dropping - Wire Wound
R82	120Ω	½	6R5551	BTS-120	Damping
R83	7.5Ω	5	17K711027		Surge Limiter - Wire Wound

Note 1. Not used in all Models
Note 2. Some Models use a 2200Ω Resistor in this application
Note 3. Used only on chassis #TS-326
* Special Resistor 19Ω Hot. Some Models use alternate resistor (Part #17K711560)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T1	50Ω	210Ω	25K702429J 25K702429 ① 25K710730 ①				Vert. Oscillator Trans.
T2	185Ω	21Ω	24C711265				Horiz. Output Trans.
	Tapped ② 18Ω	SEC. 2 0Ω					
T3	730Ω Tapped ② 1Ω		25B702445				Vert. Output Trans.
T4A	32Ω		24C703280B				Horiz. Deflection Coils
B	3.6Ω		24C703260 ① 24C702655 ① 24C702958 ①				Vert. Deflection Coils

① Alternate Unit

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T5	2KΩ	3.6Ω	210Ω	.6Ω	25B710925-C 25B710925 ①	A-3876	A-2928	RO-2	① Alternate Unit

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	P.M.	3.6Ω	50C701328 50C701634 ② 50C702057 ②	10J12	10A4A	② Alternate 10" P.M. Speaker ③ Alternate 6" E.M. Speaker ④ Alternate 8" E.M. Speaker
	CONE DIA.	V. C. DIA.				
SP1B	10"	1"	50C702550 ② 50C703099 ② 50C489002 ③ 50C711976 ③ 50C701615 ③ 50C711061 ③ 50K700850 ④ 50C703098 ④ 50C703337 ④		6E100S 8E100S	

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.190ADC	54Ω	1.3Henries	25B701075	C-2326	C-2996	TR-3300 ⑤	⑤ Fabricate Mounting Bracket,

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	MERIT PART No.	NOTES
L2	Ant. Matching Coil	0Ω		24A790033		
L3	Ant. Primary Coils	0Ω		24K703079		Low Frequency
L4	Ant. Primary Coils	0Ω		24K703078		High Frequency
L5	Ant. Coils	0Ω		24K703033		Channels 2 thru 6
L6	RF Coil	0Ω		24C703076		Channel 13
L7	RF Coils	0Ω		24K703002		Channels 2 thru 6
L8	RF Choke	8.2Ω		24K792577		
L9	Osc. Coil	0Ω		24K703077		Channel 13
L10	Osc. Coils	0Ω		24C703001		Channels 2 thru 6
L11	1st. Video IF	.2Ω	.2Ω	24B702983		
L12	Fil. Choke	0Ω				
L13	2nd. Video IF	.3Ω	.3Ω	1X712105		
L14	3rd. Video IF	.3Ω	.3Ω	1X712106		
L15	4th. Video IF	.5Ω	.5Ω	24K712104		Includes trap, resistor, capacitor and RF Choke
L16	RF Choke	2.8Ω		24B711413		
L17	Peaking Coil	11.8Ω		24K712101		Wound on 5.6K Resistor
L18	4.5MC Trap	4Ω		1X792736		
L19	Peaking Coil	9.8Ω		24K710140		
L20	Peaking Coil	15.5Ω		24K712102		Wound on 6.8K Resistor
L21	Sound IF	1.1Ω		1X790341		
L22	Ratio Det.	2.7Ω	.3Ω	24B702543		Tertiary Winding .3Ω
L23	Horiz. Osc.	47Ω		24K701558		
L24	Horiz. Lin.	13.5Ω		24A710751		Wound on .15MFD Capacitor

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA MOTOROLA PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	NOTES
M1	.215A	48B703089	NH-5	6Q4	1090	
M2	.215A	48B703089	NH-5	6Q4	1090	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	RF Tuner	1X711303	TT-24 Complete (Chassis TS-325A & TS-326A)
M4A	Crystal	48C711052	(In60)
B	Crystal	48K711077	Alternate
C	Crystal	48K712198	Alternate
D	Crystal	48K712199	Alternate
E	Crystal	48K712200	Alternate
M5	Switch	40A712292	Area Selector (Local-Suburban-Fringe)
M6A	Centering Magnet	48A711242	
B	Centering Magnet	48A711264	Alternate
C	Centering Magnet	48A711241	Alternate
D	Centering Magnet	48A710701	Alternate
M7A	Ion Trap	24K711843	
B	Ion Trap	24K711842	Alternate
C	Ion Trap	24K711841	Alternate
	Knob	36C700886	Channel Selector } Models 17F12, 17F12A,
	Knob	36C700888	Fine Tuning & Off/On Volume } 17F12B, 17F12BA
	Knob	36K700887	Contrast
	Lever	36K712007	Tone
	Knob	36C712029	Channel Selector
	Knob	36C712031	Fine Tuning & Off/On Volume } Models 17K12, 17K12A, 17K12B,
	Knob	36K712030	Contrast } 17K12BA, 17K12W, 17K12WA
	Lever	36K712007	Tone
	Knob	36C700733	Channel Selector
	Knob	36C700732	Fine Tuning & Off/On Volume } Models 17T7, 17T7A
	Knob	36K700734	Contrast
	Lever	36K712007	Tone
	Knob	36C712027	Channel Selector
	Knob	36C712026	Fine Tuning & Off/On Volume } Models 17T8, 17T8A,
	Knob	36K712028	Contrast } 17T8B, & 17T8BA
	Lever	36K712007	Tone

PHONO CARTRIDGE and NEEDLE

ITEM No.	MOTOROLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M8		GC-AG-J	G-AG	WC36B	A56U	43	0-2 or S-2	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTING SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA MOTOROLA PART No.	WALCO PART No.	JENSEN PART No.	REMARKS
M9		W-20 AGA or W-21 AGS	E-962 or E-902	

MOTOROLA MODELS 17F12, A, B, BA, 17K12, A, B, BA, W, WA, 17T7, A, 17T8, A, B, BA

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V18	RF Amplifier	6BA6	6BA6	7BK	
V19	Converter	6BE6	6BE6	7CH	
V20	IF Amplifier	6BA6	6BA6	7BK	
V21	Det.AVC-AF Amp.	6AV6	6AV6	7BT	
V22	Audio Output	6V6GT	6V6GT	7AC	
V23	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C86A	40	350	23B690975	AFH4-53		UPT44435-C4		TVL-4739	● Filter
B	40	250							■ Filter
C	40	250							▲ Filter *
D	40	25							Audio Output Cathode
C87	100		21B77286	SI100	D8-101	TM5T1	GP1K-101	5GA-T1	RF Coupling
C88	100		21B77286	SI100	D8-101	TM5T1	GP1K-101	5GA-T1	RF coupling
C89	.05	400	8R9816	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C90	47		21K77373	SI47	D6-470	5R5Q5	GP1K-470	5GA-Q47	Osc. Grid Cap.
C91	10000		21K482726	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Osc. Anode Bypass
C92	10000		21K482726	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Conv. Plate Dec.
C93	10000		21K482726	BPD-01	DD-103	TM5S1	821-01	5HK-S1	IF Amp. Plate Dec.
C94	10000		21K482726	BPD-01	DD-103	TM5S1	821-01	5HK-S1	IF Amp. Screen Bypass
C95	.01	400	8R9809	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C96	.005	600	8R9813	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C97	100		21B77286	SI100	D6-101	TM5T1	GP1K-101	5GA-T1	AF Amp. Plate Bypass
C98	.005	600	8R9813	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C99	.005	600	8R9813	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C100	.01	400	8R9809	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C101	.002	600	8R9847	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Output Plate
C102	.047	400	8R490232	489-ZGXY-05		PJ4S5		4TM-S47	Line Filter

* Not used in all models when C84C is not used, C84 part no. is 23B610587.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R84A	2Meg	½	18A600974	Q13-139X	AT-115	ANT-80	Volume Control - Tapped @ 600KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R84A per instructions
C	Switch		Not Req.	76-1	SW-A	K-155	Attach to R84A per instructions
R85A	1Meg	½	18K77399	Q14-137		AN-68	Tone Control
B	Shaft		Not Req.	Not Req.		AK-4	Attach to R85A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
R86	1Meg	½	6R6004	BTS-1Meg	RF Amp. Grid
R87	68Ω	½	6R2039		RF Amp. Cathode
R88	4700Ω	½	6R6080	BTS-4700	RF Amp. Plate
R89	47KΩ	½	6R6056	BTS-47K	Oscillator Grid
R90	33KΩ	½	6R6012	BTS-33K	Converter Grid
R91	2200Ω	½	6R6290	BTS-2200	Converter Plate Dec.
R92	15KΩ	2	6R5732	BTB-15K	Screen Dropping
R93	270Ω	½	6R6432	BTS-270	IF Amp. Cathode
R94	2200Ω	½	6R6290	BTS-2200	IF Amp. Plate Dec.
R95	47KΩ	½	6R6056	BTS-47K	Diode RF Filter
R96	470KΩ	½	6R6032	BTS-470K	Diode Load
R97	2.2Meg	½	6R3927	BTS-2.2Meg	AVC Network
R98	68KΩ	½	6R6074	BTS-68K	Tone Compensation
R99	10Meg	½	6R2109	BTS-10Meg	AF Amp. Grid
R100	220KΩ	½	6R6015	BTS-220K	AF Amp. Plate
R101	470KΩ	½	6R6032	BTS-470K	Output Grid
R102	270Ω	1	6R6336	BTA-270	Output Cathode
R103	1000Ω	2	6R3922	BTB-1000	Filter

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T6	117VAC @ .56A	500VCT @ .075 ADC	5VAC @ 2A	6.3VAC @ 2.5A	25B600684			

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T7	6KΩ	3.6Ω	640Ω	.5Ω	25B502142	A-3877 ⑥	A-3019	RO-9 ⑥	⑥ Drill one new mounting hole.

COILS (RF-IF)

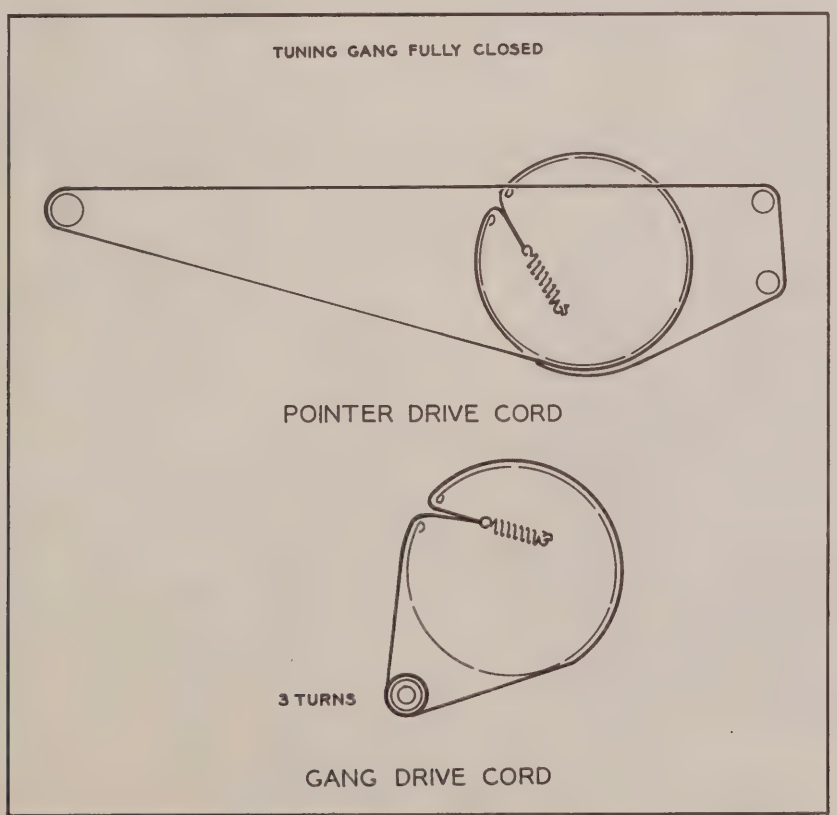
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MERIT PART No.	
L25	Loop Ant.	3Ω		24C690896		
L26	Osc. Coil	.3Ω	7.9Ω	24K691878		
L27	Input IF	17Ω	17Ω	24C485553	BC-352	
L28	Output IF	17.5Ω	17.5Ω	24K485555		

DIAL LIGHTS

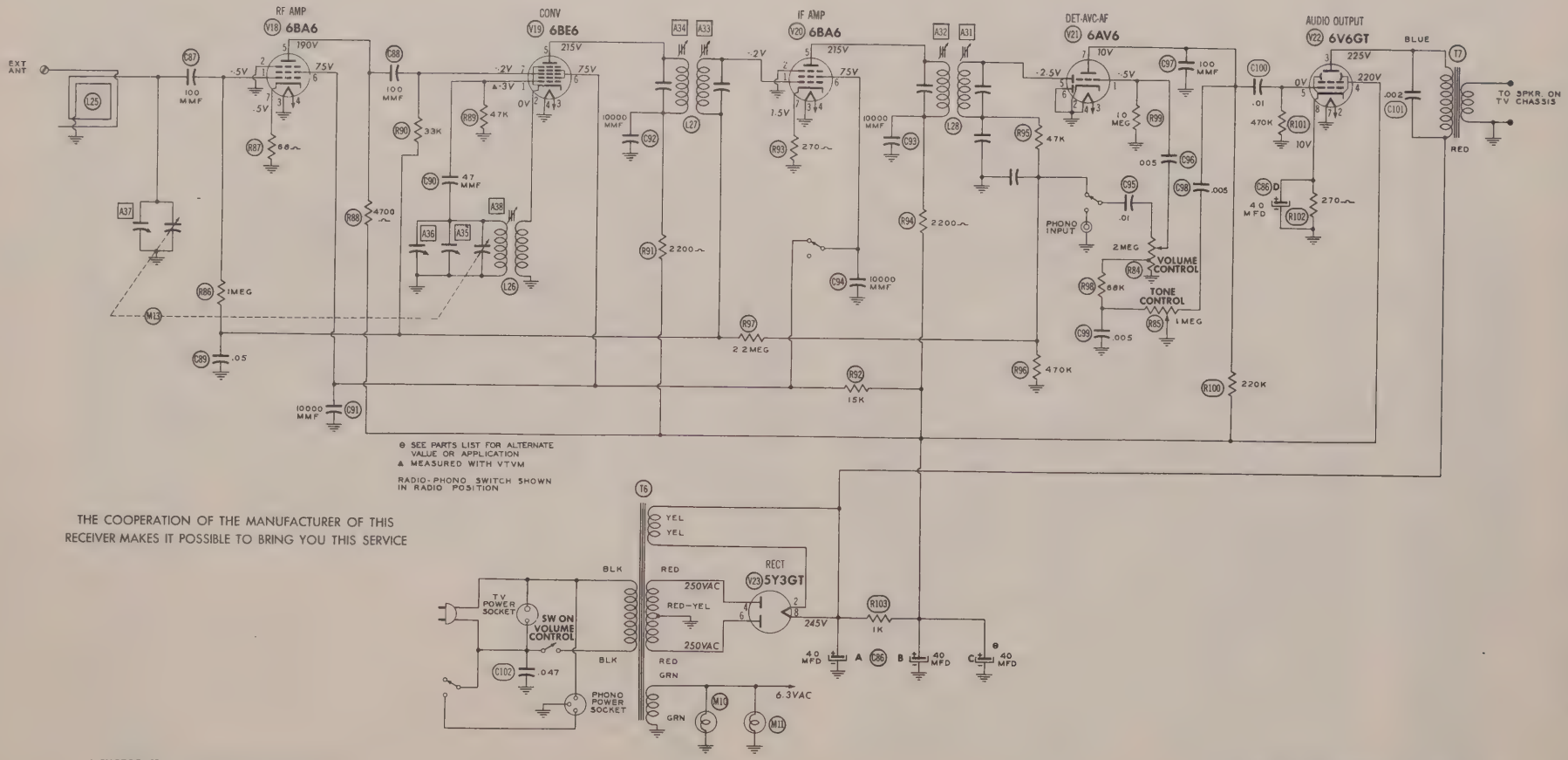
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M10	Bayonet	6-8	.25	Blue	65X10867		Type #44
M11	Bayonet	6-8	.25	Blue	65X10867		Type #44

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M12	Switch	40B601065	Radio-Phono
M13	Tuning Cap	19B691877	17-464MMF-31-197MMF
	Knobs	36C701150	OFF/ON Volume, Radio-Phono, Tuning and Tone Models 17F12, 17F12A, 17F12B & 17F12BA



DRIVE CORD STRINGING



⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
▲ MEASURED WITH VTVM
RADIO-PHONO SWITCH SHOWN IN RADIO POSITION

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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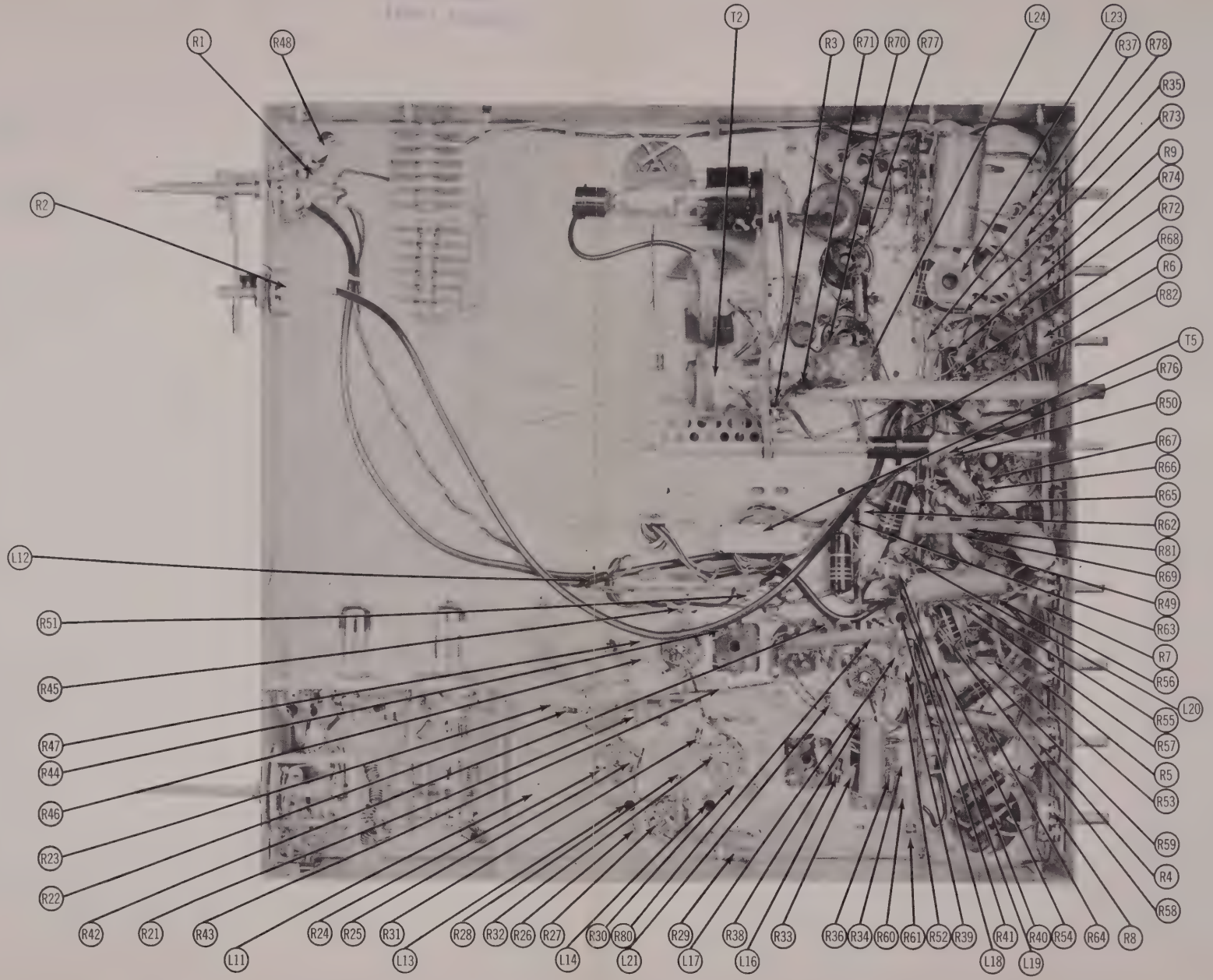
MOTOROLA MODELS 17F12, A, B, BA, 17K12, A, B, BA, W, WA, 17T7, A, 17T8, A, B, BA

RADIO SCHEMATIC



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

PHILCO MODELS 52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244

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MODEL 52-T2108

PHILCO MODELS 52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244

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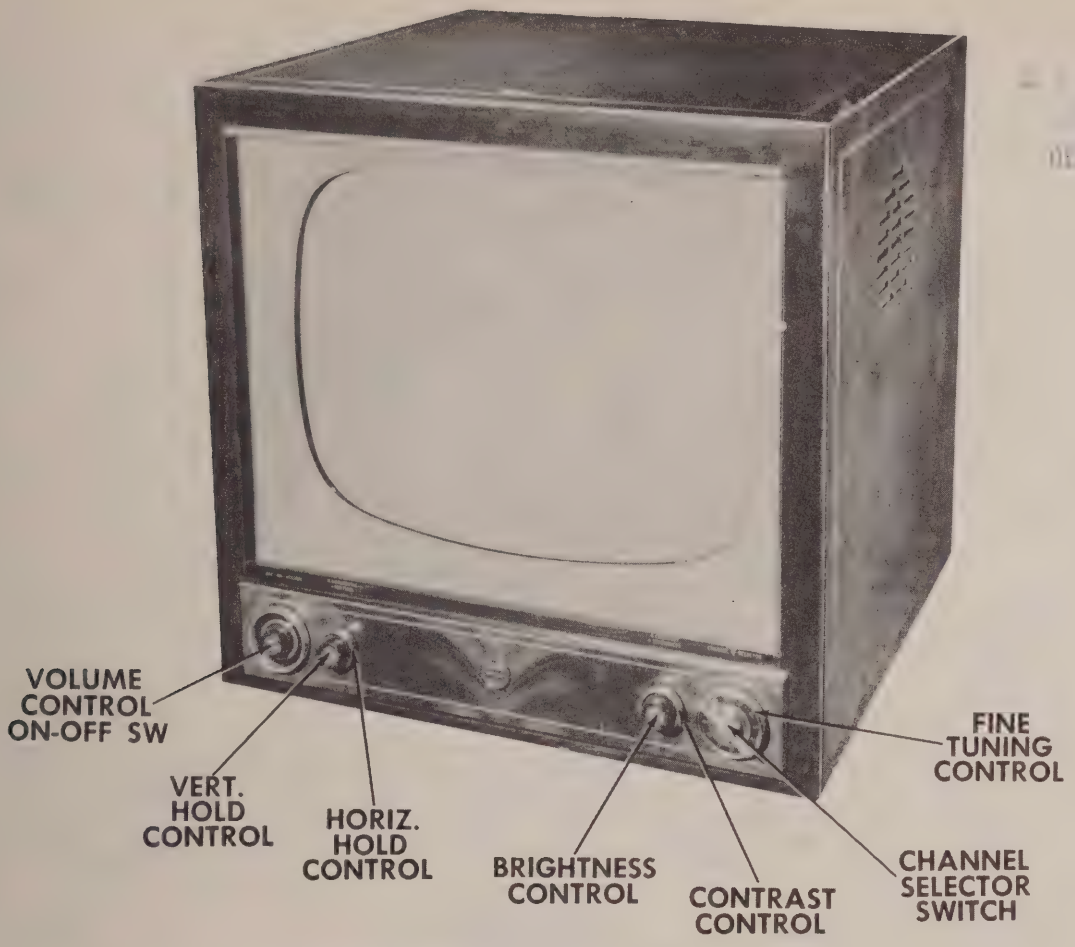
DATE 6-52 SET 171 FOLDER 9

PHILCO MODELS 52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244



Philco Model 52-T2108

TRADE NAME	Philco Models 52-T2106, T2108, T2110, T2140, T2144, T2244 (RF-IF CH. 41), (Sweep Ch. D1), Code 121
MANUFACTURER	Philco Corp, Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	Television Receiver
TUBES	Twenty One
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.9 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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PHILCO MODELS 52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244

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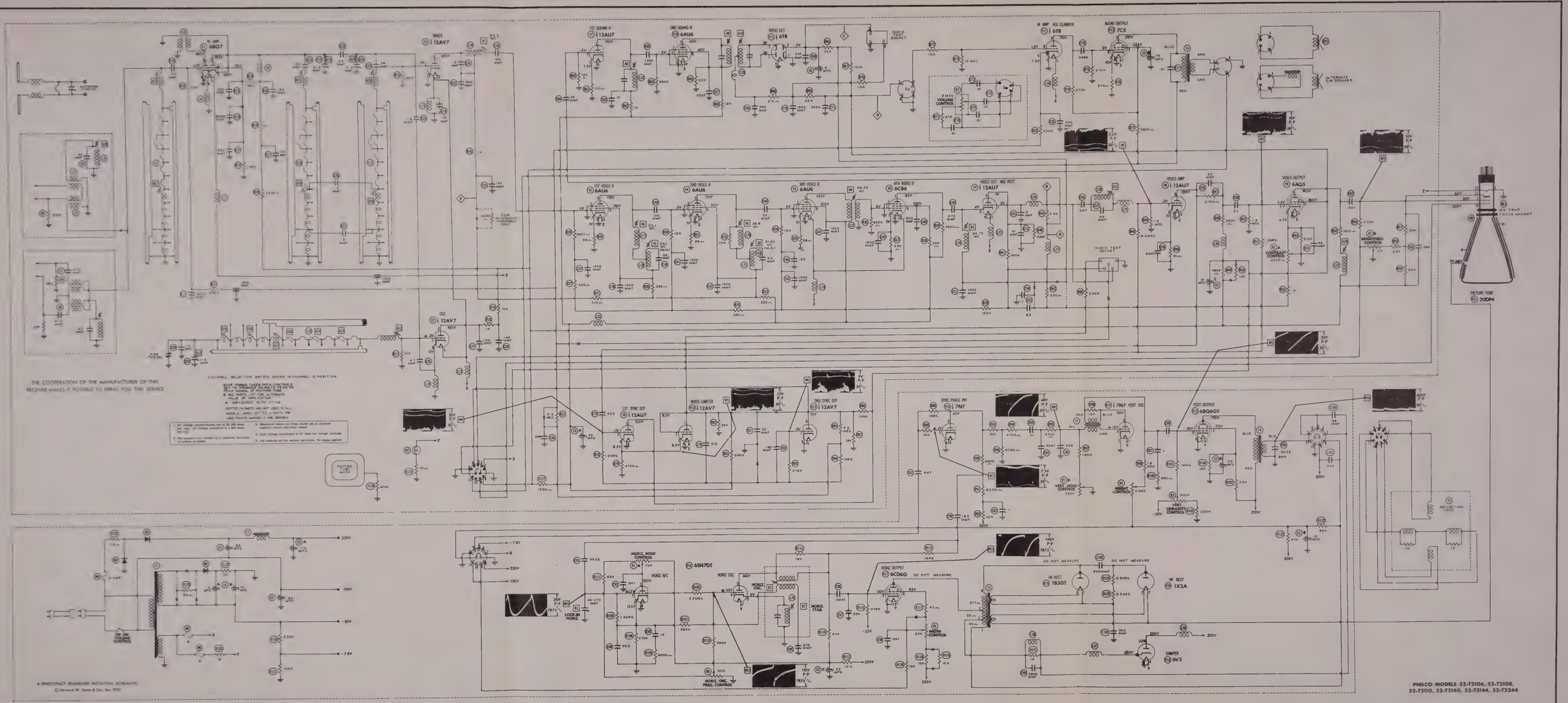
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
A - MEASURED WITH VTVM
B - MEASURED WITH SCOPE
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
1. DC voltage measurements are at 95, 000 ohms per volt. AC voltage measured at 1, 000 ohms per volt.
2. The resistors are counted in a clockwise direction on bottom of resistor.
3. Measured values are from socket pin to chassis ground unless values otherwise stated
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation. No signal applied
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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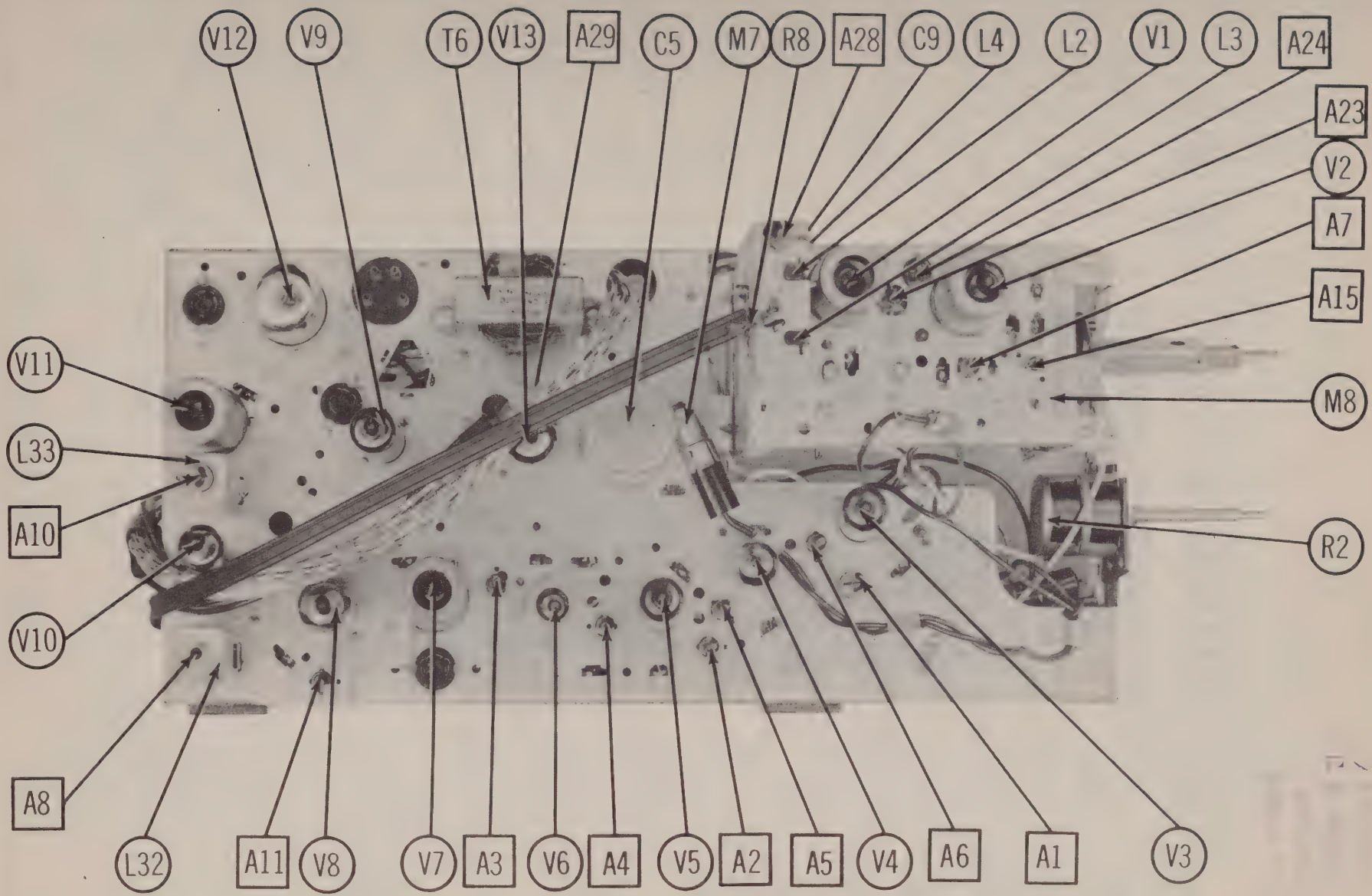
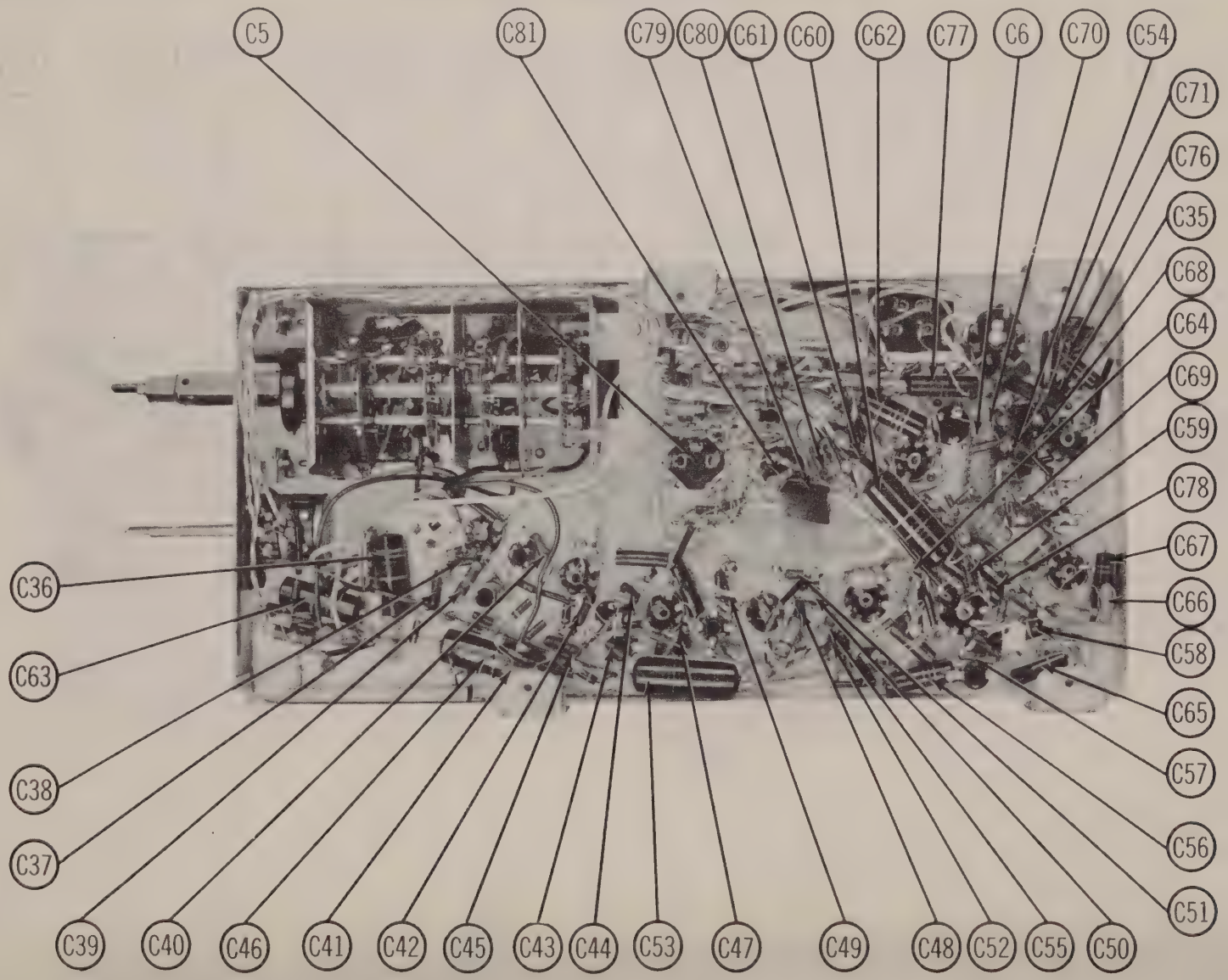
PHILCO MODELS 52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244

PHILCO MODELS 52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244



RF-IF CHASSIS-TOP VIEW



RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

L. F. E
3924 MEADE ST.
DENVER, COLORADO

V2 12AV7 CONV
V1 6BQ7 RF AMP
V3 6AU6 1ST VIDEO IF
V4 6AU6 2ND VIDEO IF
V5 6AU6 3RD VIDEO IF
V6 6CB6 4TH VIDEO IF
V7 12AU7 VIDEO DET AGC RECT 1ST SOUND IF
V8 12AU7 VIDEO AMP 1ST SYNC SEP
V9 6AQ5 VIDEO OUTPUT
V10 6AU6 2ND SOUND IF
V11 6T8 RATIO DET AF AMP AGC CLAMPER
V12 7C5 AUDIO OUTPUT
V13 12AV7 NOISE LIMITER 2ND SYNC SEP
V14 7N7 SYNC PHASE INV VERT OSC
V15 6BQ6GT VERT OUTPUT
V16 6SN7GT HORIZ AFC HORIZ OSC
V17 6CD6G
V18 6V3 DAMPER
V19 1B3GT HV RECT
V20 1X2A HV RECT
L1 L4 L16 L17 L18 L20 L21 L23 L24 L28 L31 L32 L33 L35
T1 T2 T6
C1 C2 C3 C5
HORIZ OUTPUT

TOP VIEW

V19 1B3GT
V18 6V3 DAMPER
V16 6SN7GT HORIZ AFC HORIZ OSC
V15 6BQ6GT VERT OUTPUT
V14 7N7 SYNC PHASE INV VERT OSC
L35
C1
C2
C3
V2 12AV7 CONV
V1 6BQ7 RF AMP
V3 6AU6 1ST VIDEO IF
V4 6AU6 2ND VIDEO IF
V5 6AU6 3RD VIDEO IF
V6 6CB6 4TH VIDEO IF
V7 12AU7 VIDEO DET AGC RECT 1ST SOUND IF
V8 12AU7 VIDEO AMP 1ST SYNC SEP
V9 6AQ5 VIDEO OUTPUT
V10 6AU6 2ND SOUND IF
V11 6T8 RATIO DET AF AMP AGC CLAMPER
V12 7C5 AUDIO OUTPUT
V13 12AV7 NOISE LIMITER 2ND SYNC SEP
L4 L16 L18 L20 L21 L23 L24 L28 L31 L32 L33
C5

BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.
Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of R29 and R41. Connect the positive lead to chassis. Preset A1 and A2 fully counter clockwise. Preset A5 and A6 to the center of their range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to pin 2 (grid) of 12AZ7 (V2). Low side to chassis.	28.1MC (unmod.)	Any not used locally.	DC probe to Point (A). Common to Point (B).	A1	Adjust for MINIMUM deflection. Use zero bias.
2.	"	"	21.85MC	"	"	A2	"
3.	"	"	24.75MC	"	"	A3	Adjust for maximum deflection. Attenuate generator to maintain 2 volt reading.
4.	"	"	26.25MC	"	"	A4	"
5.	"	"	26.6MC	"	"	A5	"
6.	"	"	23.1MC	"	"	A6	"
7.	"	"	23.5MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.001MFD	High side to pin 2 (grid) of 12AZ7 (V2). Low side to chassis.	24MC (10MC Swp)	22.5MC 26.6MC	Any not used locally.	Vert. amp. to point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary make minor adjustments of A3 thru A7 for proper response.

SOUND IF ALIGNMENT

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	2200Ω Carbon Resistor	High side thru 2200Ω to point A . Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any not used locally	Vert. amp. to point (C). Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C6. Adjust for maximum amplitude and symmetry as per fig. 2.
10.	"	"	"	"	"	Vert. amp. to point (D). Low side to chassis.	A10	Reconnect capacitor C6. Adjust so 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	2200Ω Carbon Resistor	High side thru 2200Ω to point (A). Low side to chassis.	Not used.	4.5MC (400% Mod.)	Any not used locally	Vert. amp. to pin 2 (grid) of picture tube Low side to chassis.	A11	Adjust for minimum 400% indication on scope.

OSCILLATOR ALIGNMENT

Reduce the bias as used during video IF alignment, to 1.5 volts.
Preset the fine tuning control to the mid-position of its range (the stop on the cam centered on channel 6 adjustment screw).
Starting with channel 13, every other coil is tunable therefore it is possible to set either of two adjacent channels on exact frequency, i.e. 13 or 12, 11 or 10, etc.
Connect a 3300Ω resistor in series with the red lead from the tuner. The junction of the resistor and the red lead is alignment Point (E).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Direct	Across antenna terminals.	Not used	237.85MC (unmod.) 225.85MC 213.85MC	13 11 9	Vert. amp. to Point (E). Low side Low side to chassis.	A12 A13 A14	Adjust for zero beat indication on scope.
13.	"	"	"	207.85MC	8	"	A15	Check channel 8 oscillator frequency. If too high, adjust A15 clockwise, if too low adjust counterclockwise. Repeat steps 12 and 13 until oscillator frequencies are correct on channels 13, 11, 9 and 8.
14.	"	"	"	201.85MC 109.85MC 93.85MC 81.85MC	7 6 4 2	"	A16 A17 A18 A19	Adjust for zero beat indication on scope.

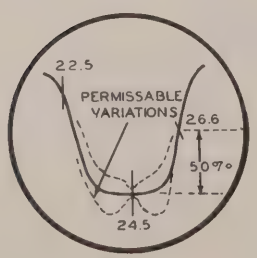


FIG. 1

FIG. 2

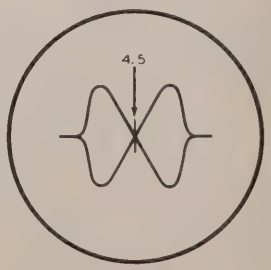


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

Disconnect the white lead from tuner and connect to the negative lead of a 1.5 volt battery. Connect the positive lead to chassis.
Connect a 330Ω resistor from the green lead to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC swp.)	213MC	13	Vert. amp. to Point (E) Low side to chassis.	A20, A21, A22	Detune A20 until single peak appears. Adjust A21 to place marker at center of peak. Adjust A22 for maximum height and symmetry of peak.
16.	"	"	"	211.25MC 213MC 215.75MC	13	"	A20, A21	Readjust for response curve similar to Fig.4.
17.	"	"	177MC (10MC swp.)	177MC	7	"	A23, A24	Examine response curve for center frequency and tilt. If the response is tilted adjust A23 and A24 until response is a mirror image of the original. This is necessary to compensate for previous channel 13 adjustments. See figures 5A and 5B for example of compensated response curve. Repeat steps 15, 16 and 17 until proper response is obtained on both channels 7 and 13.
18.	"	"	85MC (10MC swp.)	85MC	6	"	A25, A26 A27	Detune A25 until a single peak appears. Caution: Do not turn A25 excessively or it will fall out of the coil. Adjust A26 so 85MC falls at center of single peak. Adjust A27 for maximum amplitude and symmetry of peak.
19.	"	"	"	83.25MC 85MC 87.75MC	"	"	A25, A26	Readjust A25 and A26 for response similar to Fig. 4.

FM TRAP ADJUSTMENT

The FM trap, A28, is factory adjusted to eliminate interference at 100MC. If interference is experienced from an FM station at some other frequency it can be reduced by tuning in the TV station affected and adjusting A28 for minimum interference.

VIDEO OUTPUT PEAKING COIL ADJUSTMENT

The video output peaking coil is adjusted at the factory for proper transient response of the video amplifiers. If this coil is replaced in servicing, adjustment will be necessary. Also, on some stations where excessive smear is present adjustment may improve the picture quality on that station at the possible sacrifice of quality on others. Before adjusting, make certain that tuner and IF alignments are correct, then tune in the station and adjust A29 so there are no trailing whites or smear in the picture. Check other stations to see that quality has not been impaired.

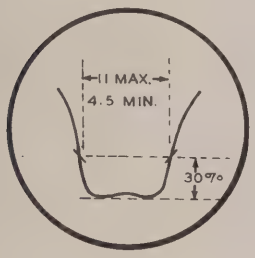
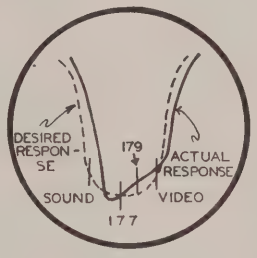
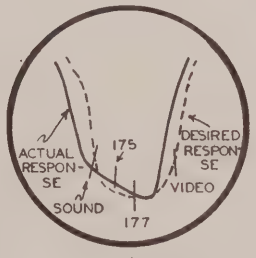


FIG.4



ORIGINAL
FIG.5A



COMPENSATED
FIG.5B

PHILCO MODELS 52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244

RESISTANCE MEASUREMENTS

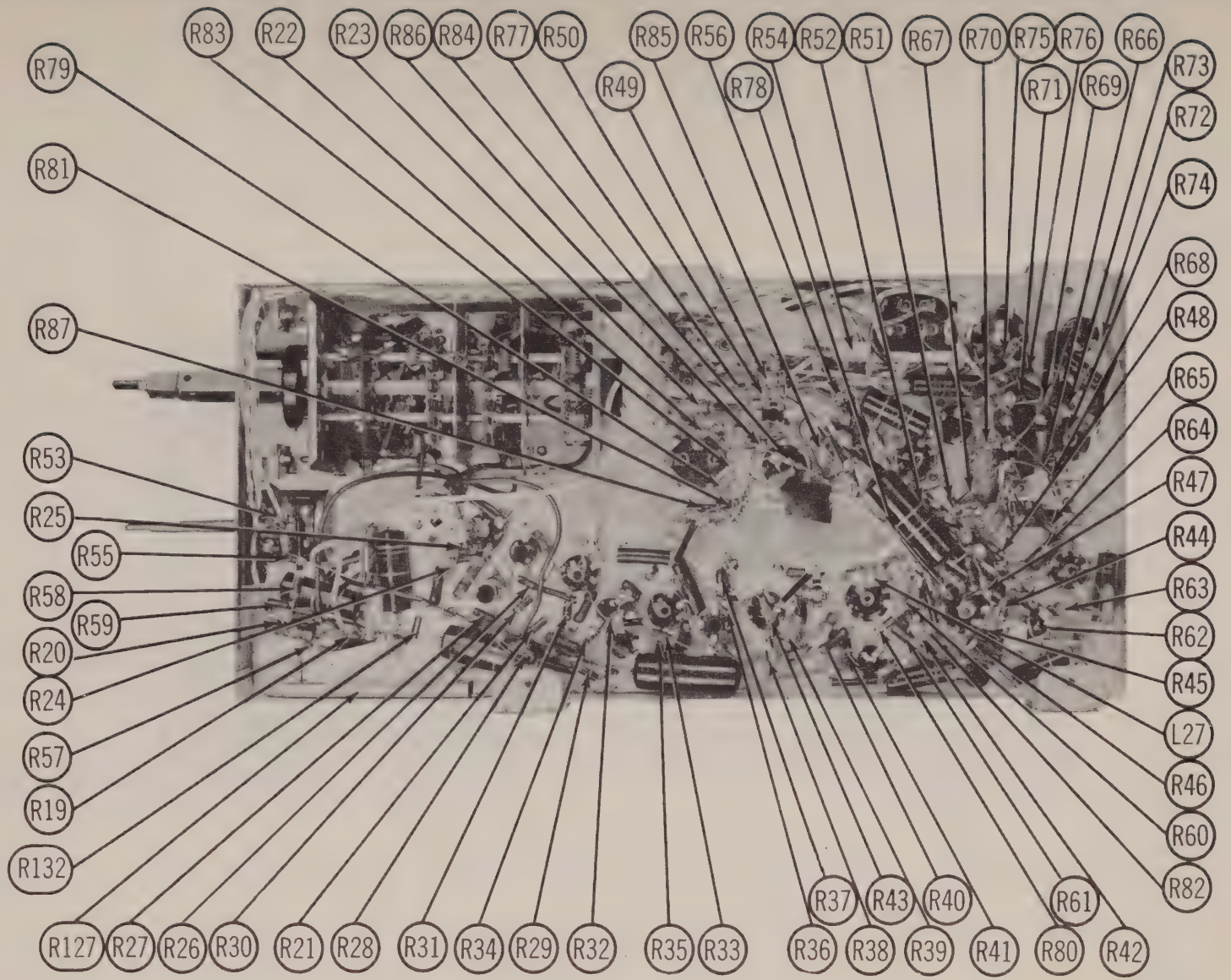
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	†3.2KΩ	550KΩ	INF	.1Ω	.2Ω	INF	9.4Meg.	0Ω	0Ω
V 2	12AV7	†3.2KΩ	100KΩ	0Ω	.2Ω	.2Ω	†16KΩ	10KΩ	.2Ω	.1Ω
V 3	6AU6	535KΩ	0Ω	0Ω	.1Ω	†2.2KΩ	†2.2KΩ	68Ω		
V 4	6AU6	540KΩ	0Ω	0Ω	.1Ω	†1.9KΩ	†1.9KΩ	68Ω		
V 5	6AU6	540KΩ	0Ω	0Ω	.1Ω	†1.6KΩ	†1.6KΩ	68Ω		
V 6	6CB6	.2Ω	220Ω	0Ω	.1Ω	†7.2KΩ	†1.9KΩ	0Ω		
V 7	12AU7	†2.6KΩ	120KΩ	150Ω	.2Ω	.2Ω	330KΩ	6.7KΩ	3.4KΩ	0Ω
V 8	12AU7	†3.8KΩ	8Meg	4.7KΩ	0Ω	0Ω	†10KΩ	1.2Meg	91Ω	.1Ω
V 9	6AQ5	750KΩ	500Ω	0Ω	.1Ω	†1.8KΩ	†3.8KΩ	750KΩ		
V 10	6AU6	680KΩ	0Ω	0Ω	.1Ω	†8KΩ	†8KΩ	0Ω		
V 11	6T8	INF	36KΩ	INF	0Ω	.2Ω	9.7Meg	0Ω	10Meg	†270KΩ
V 12	7C5	.1Ω	†465Ω	†5.6KΩ	INF	†45Ω	470KΩ	270Ω	0Ω	
V 13	12AV7	39KΩ	39KΩ	4.7KΩ	0Ω	0Ω	15KΩ	7Meg	0Ω	.1Ω
V 14	7N7	.1Ω	0Ω	†2Meg	240KΩ	1Meg	14KΩ	0Ω	0Ω	
V 15	6BQ6GT	180KΩ	.1Ω	INF	11KΩ	1.3Meg	INF	0Ω	0Ω	TOP CAP† †355Ω
V 16	6SN7GT	1.3Meg	†40KΩ	270KΩ	270KΩ	†47KΩ	58Ω	.1Ω	0Ω	
V 17	6CD6G	†6KΩ	.1Ω	0Ω	INF	550KΩ	INF	0Ω	†6KΩ	TOP CAP #31Ω
V 18	6V3	INF	†50Ω	INF	.1Ω	0Ω	INF	Pin 7 †50Ω / Pin 8 INF	Pin 9 †50Ω	TOP CAP †115KΩ
V 19	1B3GT	PINS 1-8 HAVE INF RESISTANCE.								TOP CAP #300Ω
V 20	1X2A	PINS 1-9 HAVE INF RESISTANCE								TOP CAP INF.
V 21	20DP4A	0Ω	440KΩ	Pin 10 †47KΩ	Pin 11 150KΩ	Pin 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM OUTPUT OF M1
# MEASURED FROM TOPCAP OF V18.

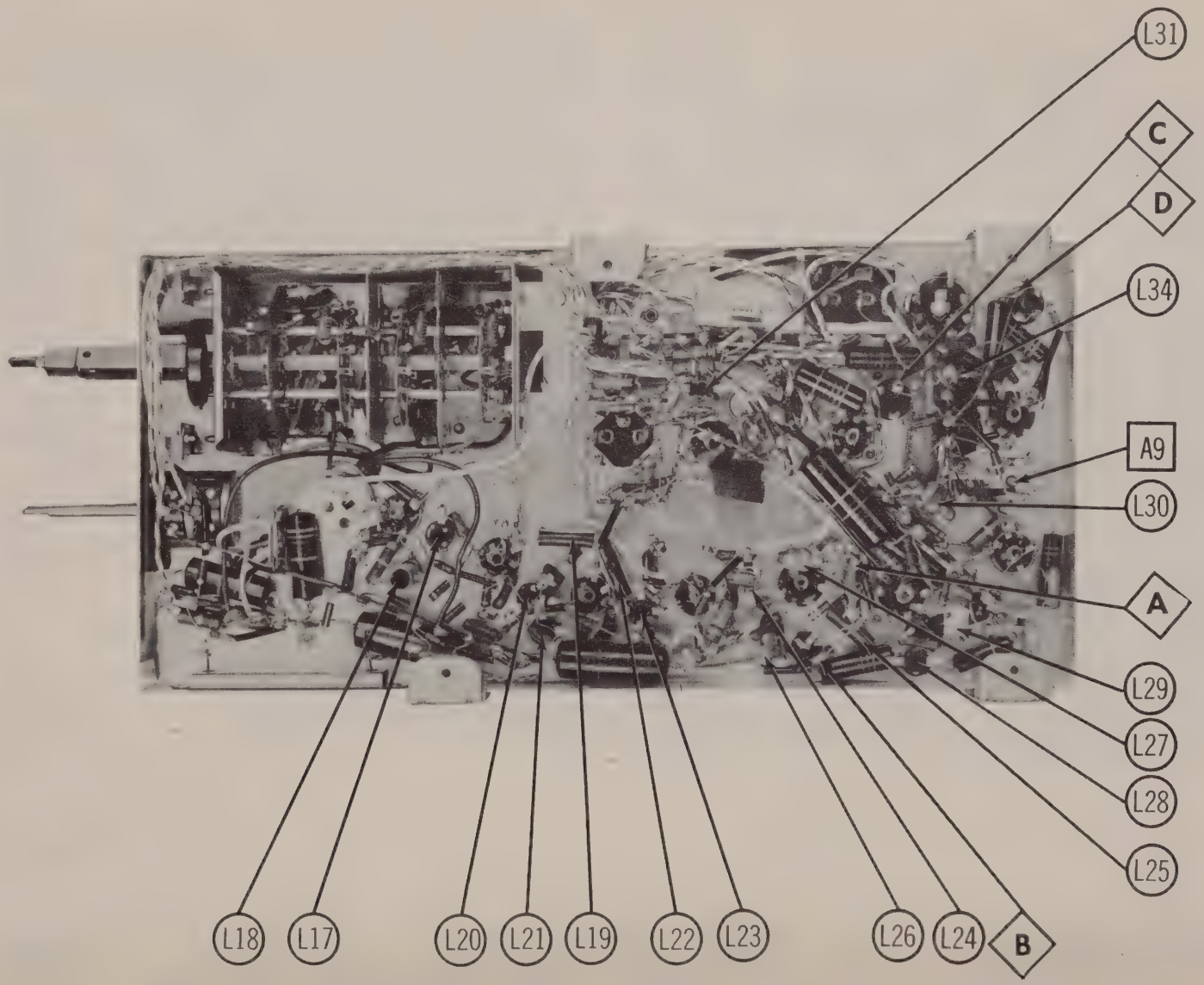
DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front panel.
2. Disconnect built-in antenna and transmission line from rear cover.
3. Remove 12 wood screws. Remove rear cover.
4. Disconnect speaker plug and volume control Plug from RF-IF Chassis.
5. Remove 4 nuts holding speaker. Remove speaker.
6. Disconnect CRT socket from picture tube, and interconnecting cable from sweep chassis.
7. Remove pilot light from clamp in front of RF-IF Chassis.
8. Remove 4 chassis bolts. Remove RF-IF Chassis.
9. Disconnect yoke plug from sweep chassis and HV lead from CRT.
10. Remove 4 chassis bolts. Remove sweep chassis.

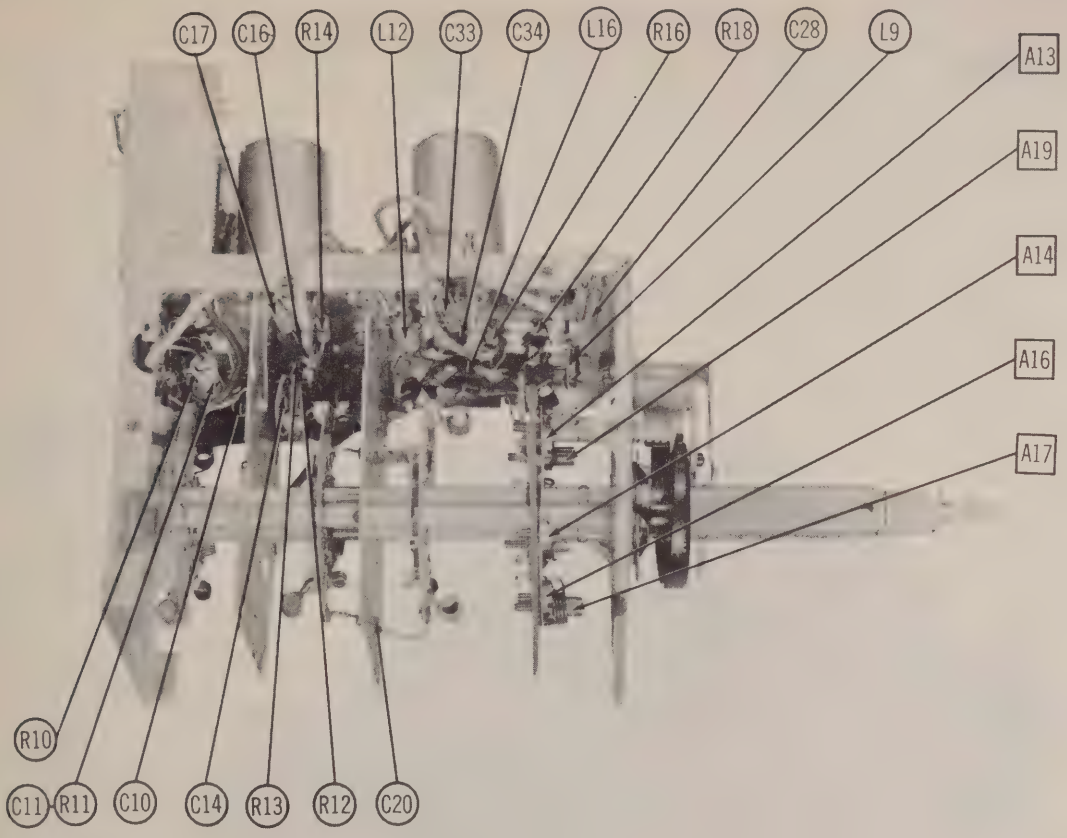
NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE RF IF- AND SWEEP CHASSIS AS OUTLINED ABOVE.



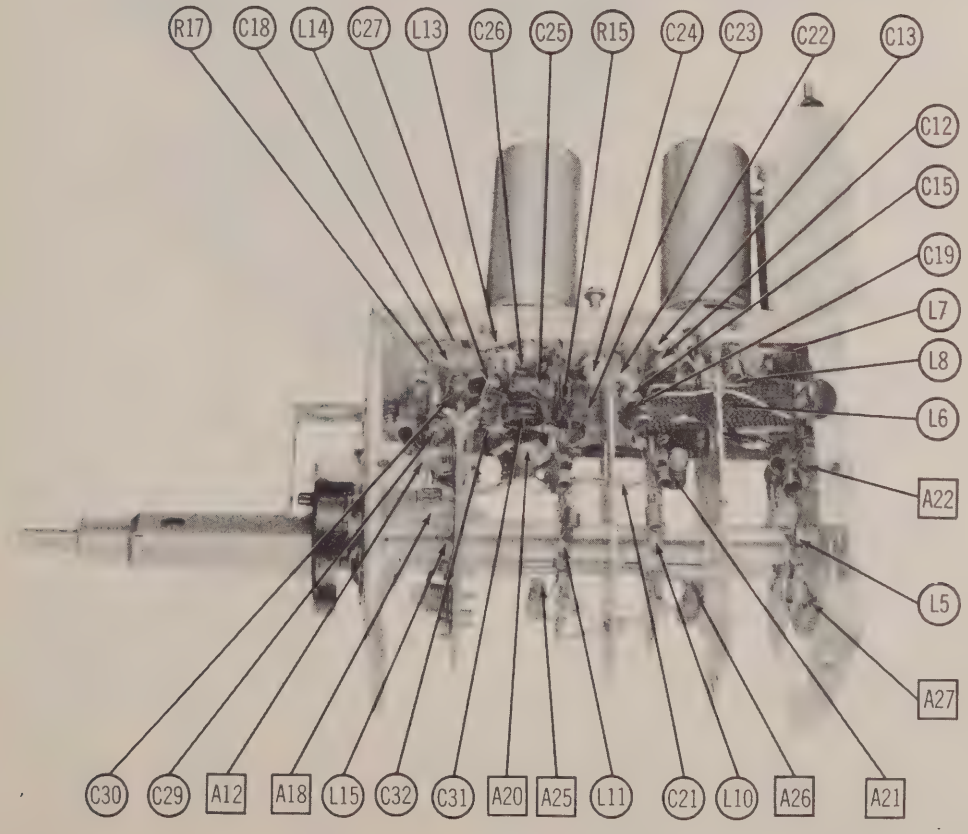
RF-IF CHASSIS-BOTTOM VIEW- RESISTOR IDENTIFICATON



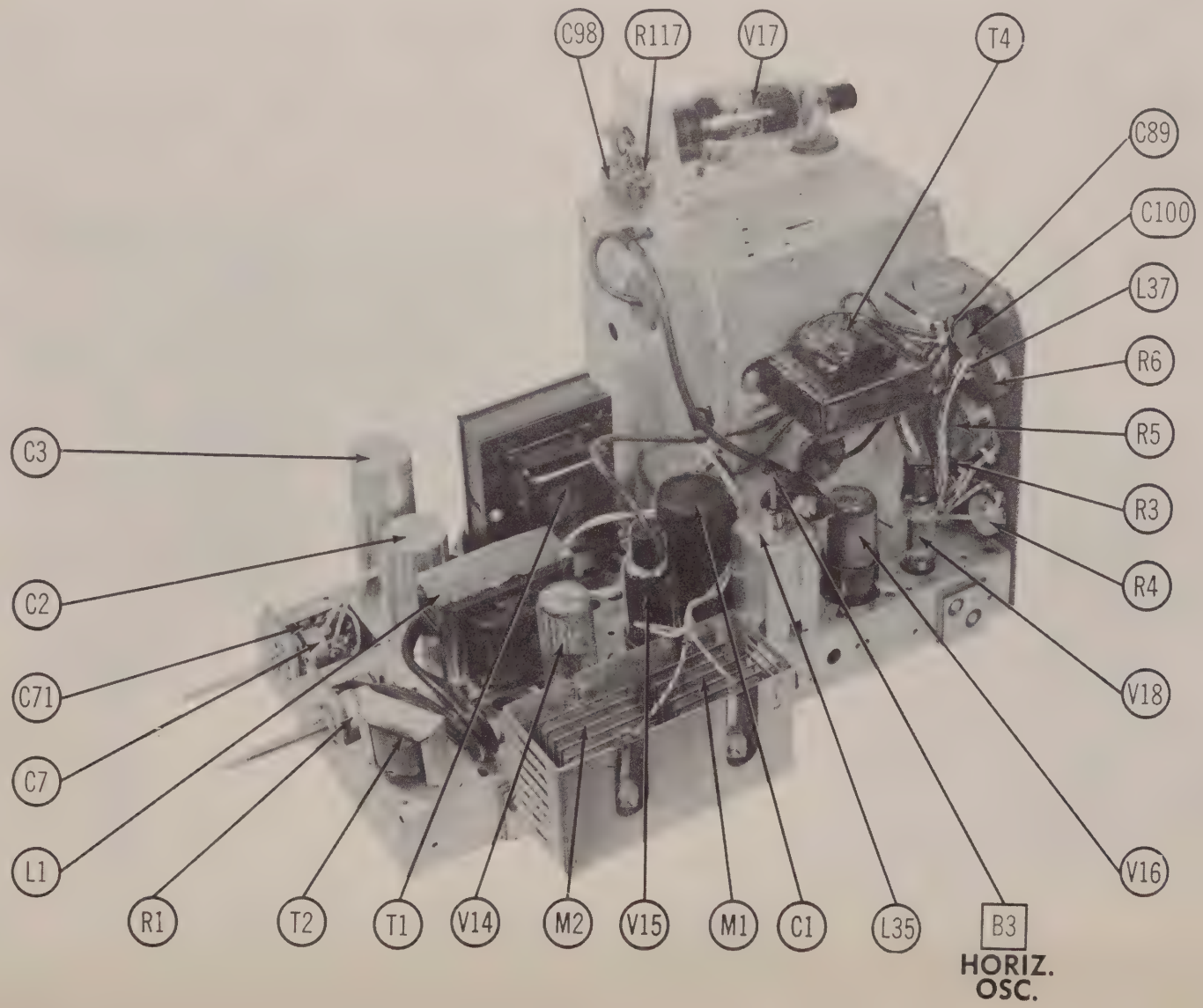
RF-IF CHASSIS-, INDUCTOR AND ALIGNMENT IDENTIFICATION



RF TUNER-LEFT SIDE



RF TUNER-RIGHT SIDE



SWEEP CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BQ7	6BQ7	9AJ	
V2A	Converter	12AV7	12AV7	9A	
B	Converter	12AZ7	12AZ7	E9-1	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	4th. Video IF Amp.	6CB6	6CB6	7CH	
V7	Video Detector-AGC Rectifier - 1st. Sound IF Amp.	12AU7	12AU7	9A	
V8A	Video Amplifier-1st. Sync. Separator	12AU7	12AU7	9A	
B	Video Amplifier-1st. Sync. Separator	12AV7	12AV7	9A	
V9	Video Output	6AQ5	6AQ5	7BZ	
V10	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector-AF Amplifier - AGC Clamper	6T8	6T8	9E	
V12	Audio Output	7C5	7C5	6AA	
V13A	Noise Limiter - 2nd. Sync. Separator	12AV7	12AV7	9A	
B	Noise Limiter - 2nd. Sync. Separator	12AU7	12AU7	9A	
V14	Sync. Phase Inv. - Vert. Oscillator	7N7	7N7	8AC	
V15	Vert. Output	6BQ6GT	6BQ6GT	6AM	
V16	Horiz. AFC-Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6CD6GT	6CD6GT	5BT	
V18	Damper	6V3	6V3	9BD	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20A	H. V. Rectifier	1X2A	1X2A	9Y	
B	H. V. Rectifier	1X2	1X2	9Y	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	PHILCO PART No.	SYLVANIA PART No.			
V21A	20DP4A	20DP4A		12D	① 5/16" shorter
		20CP4 ① ②		12D	② Circuit changes necessary
		20CP4A ①		12D	
		20HP4 ②		12C	
		20MP4 ②		12C	
		20LP4 ②		12C	
		20HP4A ②		12C	
		20DP4 ②		12D	
B	21EP4A	21EP4A		12D	
		21EP4 ②		12D	
		21FP4 ②		12C	
		21FP4A ②		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	120	150	30-2570-66	E4A130		UPE15020		TVL-1428	Filter
C2	120	150	30-2570-66	E4A130		UPE15020		TVL-1428	Filter
C3A	100	300	30-2584-7	AFH3-102		UPT435		TVL-4704	■ Filter
B	10	450		PRS250/20					▲ Decoupling
C	20	300							▲ Decoupling
D	20	200							Vert. Output Screen
C4A	10	50	45-3018-19	PRS50/10-10		BRD105		TVA-2315	Bias Filter
B	10	50							Bias Filter
C5A	30	300	30-2584-6			UPT211145		TVL-3772	▲ Decoupling
B	10	300							■ Audio Output Screen
C	10	300							▲ Video Output Screen
C6	2	50	30-2417-7	E26E6		BBR-2-50T		TVA-1301	Stabilizing Cap.
C7	470		62-147001001	SI470	D6-471		GP2K-471	5GA-T47	RF Coupling *
C8	470		62-147001001	SI470	D6-471		GP2K-471	5GA-T47	RF Coupling *
C9	20		62-020309011	SI20	D6-200		GP1K-200		Fixed Trimmer
C10	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	5GA-T15	RF Coupling
C11	10000			BPD-01	DD-103	TM5S1	821-01	5HK-S1	AGC Filter ♦
C12	220		30-1225-11	SI220	D6-221		GP2K-221	5GA-T22	RF Amp. Grid Bypass
C13	220		30-1225-11	SI220	D6-221		GP2K-221	5GA-T22	RF Amp. Grid Bypass
C14	20000		30-1238-5	SI20000	DF-203				RF Amp. Grid Bypass
C15	.5-3		31-6520-3		829-3				Variable Trimmer
C16	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	5GA-T15	RF Amp. Plate Dec.
C17	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	5GA-T15	RF Amp. Plate Dec.
C18	12			SI12	D6-120		GP1K-120		Osc. Fil. Bypass *
C19	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	5GA-T15	RF Coupling
C20	1.2		30-1221-7				NP0K-1R2		RF Coupling
C21	5		30-1221-13	SI5	TCZ-4.7		GP1K-050		RF Coupling
C22	.59								RF Coupling
C23	39		62-039409011	SI39	D6-390		GP1K-390		RF Coupling
C24	.5-3		31-6520-3		829-3				Variable Trimmer
C25	1.5		30-1224-59				N330K-1R5		Osc. Coupling
C26	4.7		30-1224-85	SI4.7NP0	TCZ-4.7		NP0K-4R7		Osc. Feedback
C27	150		62-115001011	SI150	D6-150	TM5T15	GP2K-151	5GA-T15	Osc. Plate Bypass
C28	150		62-115001011	SI150	D6-150	TM5T15	GP2K-151	5GA-T15	RF Bypass
C29	1-6		31-6520-2		829-6				Variable Trimmer
C30	7.5		30-1224-84				N750K-7R5		Fixed Trimmer
C31	15		62-015409011	SI15	D6-150		GP1K-150	5GA-Q15	Fixed Trimmer
C32	1500			SI1500	D6-152	TM5D15	GP2L-152	5HK-D15	Conv. Plate Dec.
C33	150		62-115001001	SI150	D6-151	TM5T15	GP2K-151	5GA-T15	RF Bypass
C34	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling †
C35	330			SI330	D6-331		GP2K-331	5GA-T33	AGC Filter

CAPACITORS (CONT.)

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C36	.068	400		P488-068		PTE4S68		4TM-S68	AGC Filter
C37	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	AGC Filter
C38	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	1st. Video IF Dec.
C39	39		30-1224- 63				N220K-390		Fixed Trimmer
C40	100		62-110009001	S1100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C41	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	AGC Filter
C42	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	2nd. Video IF Dec.
C43	22		62-022009001	S122	D6-220		GP2K-220	5GA-Q22	Fixed Trimmer
C44	33		62-033009001	S133	D6-330		GP1K-330	5GA-Q33	IF Coupling
C45	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	AGC Filter
C46	22	400		P488-22		PTE4P22		4TM-P22	AGC Filter
C47	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	3rd. Video IF Dec.
C48	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	4th. Video IF Screen
C49	1500			[illegible]	D6-152	TM5D15	GP2L-152	5HK-D15	4th. Video IF Cathode
C50	470		62-147001021	S1470	D6-471		GP2K-471	5GA-T47	IF Coupling
C51	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	RF Bypass
C52	51			S151			GP1K-510		AGC Filter ¶
C53	22	200		P488-22		PTE4P22		2TM-P2	AGC Filter
C54	1	200		P288-1	DF-104	PJ2P1		2TM-P1	RF Bypass
C55	8		30-1224-13						Video Det. Filter
C56	.047	200		P288-047	DF-503	PTE4S47		2TM-S47	Video Coupling
C57	68		62-068409011	S168	D6-680	5R5Q7	GP1K-680	5GA-Q68	Fixed Trimmer
C58	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Video Amp. Cathode
C59	53								Video Coupling ¶
C60	22	400		P488-22		PTE4P22		4TM-P22	Video Coupling
C61	56		62-056409011	S156	D6-560		GP1K-560		Video Output Cathode
C62	.047	400		P488-047	DF-503	PTE4S47		4TM-S47	Video Coupling
C63	.068	400		P488-068		PTE4S68		4TM-S68	Picture Tube Cathode
C64	56		62-056409011	S156	D6-560		GP1K-560		Sound IF Coupling
C65	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	1st. Sound IF Dec.
C66	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	Sound IF Coupling
C67	.0033	400		P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	2nd. Sound IF Dec.
C68	330		62-133001001	S1330	D6-331		GP2K-331	5GA-T33	Diode Load Cap.
C69	390	500	80-10395417	1468-0004	D6-391	5W5T4	GP2K-391	1FM-34	Diode Load Cap.
C70	1500			S11500	D6-152	TM5D15	GP2L-152	5HK-D15	RF Bypass
C71	.0022	400		P688-0022	D6-223	PTE6D22	GP2-333-222	6TM-D22	De-Emphasis
C72	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C73	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C74	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C75	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Volume Cont. Isolation
C76	.0068	400		P488-[illegible]	D6-682	PTE6D68	GP2-333-682	6TM-D68	Audio Coupling
C77	.01	1000		P1088-01		PTE10S1		MB-D1	Audio Output Plate †
C78	.022	400		P488-022	DF-203	PTE4S22		4TM-S22	Sync. Coupling ††
C79	.015	200		P288-015		PTE6S15		6TM-S15	Sync. Coupling
C80	180	500	60-10185417	5R5T2	D6-181	5R5T2	GP2K-181	MS-32	Sync. Coupling
C81	33		82-[illegible]		D6-330		GP1K-330	5GA-Q33	RF Bypass
C82	.047	400		P488-047	DF-503	PTE4S47		4TM-S47	Sync. Coupling
C83	1	400		P488-1	DF-104	PTE4P1		4TM-P1	RF Bypass
C84	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. Sync. Coupling
C85	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Vert. Integrator Net.
C86	.022	200		P288-022	DF-203	PTE4S22		4TM-S22	Vert. Integrator Net.
C87	1	400		P488-1	DF-104	PTE4P1		4TM-P1	Vert. Discharge
C88	1	400		P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling
C89	.0033	600		P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Fixed Trimmer
C90	120	500	60-10125237	1469-00015	D6-121	5R5T15	GP2K-121		Horiz. Sync. Coupling
C91	.0022	400		P[illegible]	D6-222	PTE6D22	GP2-333-222	6TM-D22	Horiz. Sync. Coupling
C92	.047	400		P488-047	DF-503	PTE4S47		4TM-S47	Horiz. AFC Plate
C93	.15	200		P288-15		PTE4P15		2TM-P15	Horiz. AFC Filter
C94	.022	200		P488-022	DF-203	PTE4S22		4TM-S22	Horiz. AFC Filter
C95	270	500	60-10275337	1469-0003		5R5T3		MS-33	Horiz. Osc. Grid Cap.
C96	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	6TM-D47	Horiz. Sweep Coupling
C97	330	500	60-10335417	1469-00035					Horiz. Drive
C98	.047	400		P488-047	DF-503	PTE4S47		4TM-S47	Horiz. Output Screen
C99	3300	500							Horiz. Sweep Coupling
C100	68	4000	30-1243-4						Fixed Trimmer
C101	.047	400		P488-047	DF-503	PTE4S47		4TM-S47	Horiz. Sweep Coupling
C102	500	20000	30-1229-4	HV20C	TV3-502	MM-C20T5			HV Doubler
C103	500	20000	30-1229-4	HV20C	TV3-502	MM-C20T5			HV Filter

* Not used in all models
• Items C11 and R11 are combined in one unit.
† Some models use 470MMF in this application.
¶ Some models use 56MMF in this application.
‡ Some models use 0068MFD in this application.
†† Some models use 0022MFD in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	75KΩ	½	33-5563-43	QT-302*	RTV-241		Horiz. Hold Control - Panel
B	250KΩ	2					Vert. Hold Control - Rear
R2A	250KΩ	2	33-5563-42				Contrast Control - Wire Wound - Panel
B	50KΩ	2					Brightness Control -Wire Wound - Rear
R3A	500KΩ	1	33-5565-2	QII-133	AG-58-S	B-59	Vert. Linearity Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R3A per instructions
R4A	5Meg	½	33-5565-31	QII-141	AG-85-S	B-87	Height Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R4A per instructions
R5	20KΩ	4	33-5548-43		RTV-185	SVP-996	Width Control - Wire Wound
R6A	50KΩ	½	33-5565-30	QII-123	AG-44-S	AN-31	Horiz. Osc. Freq. Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	2Meg	½	33-5565-14	Q18-139X	AT-116	BT-82-S	Volume Control -Tapped ② 1 Meg
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R7A per instructions
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R7A per instructions

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B-11-125 & P1-200 (Panel), B11-130 &R1-216 (Rear)

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R8	100KΩ 20%	1		BTS-100K	Antenna Isolation - See Note 1
R9	1Meg	1		BTS-1Meg	Antenna Isolation
R10	22KΩ 20%	1		BTS-22K	RF Amp. Grid
R11	470KΩ	1	■	BTS-470K	AGC Network
R12	1Meg	1		BTS-1Meg	RF Amp. Grid
R13	1Meg	1		BTS-1Meg	Voltage Divider
R14	1000Ω 20%	1		BTS-1000	RF Amp. Decoupling
R15	100KΩ 20%	1		BTS-100K	Mixer Grid
R16	1000Ω 20%	1		BTS-1000	Mixer Plate Decoupling
R17	10KΩ 20%	1			Osc. Grid
R18	1000Ω 20%	1		BTS-1000	Osc. Plate
R19	15KΩ	2		BTS-15K	Voltage Divider
R20	2200Ω	1		BTS-2200	Voltage Divider
R21	330Ω 20%	1		BTS-330	Mixer Plate Decoupling
R22	3.3Meg	1		BTS-3.3Meg	AGC Network
R23	330KΩ 20%	1		BTA-330K	AGC Network
R24	6800Ω	1		BTS-6800	1st. Video IF Amp. Grid
R25	68Ω	1			1st. Video IF Amp. Cathode
R26	330Ω 20%	1		BTS-330	1st. Video IF Amp. Decoupling
R27	330Ω 20%	1		BTS-330	AGC Network
R28	330Ω 20%	1		BTS-330	AGC Network
R29	100KΩ 20%	1		BTS-100K	AGC Network
R30	12KΩ	1			2nd. Video IF Amp. Grid
R31	68Ω	1			2nd. Video IF Amp. Cathode
R32	33KΩ 20%	1		BTS-33K	2nd. Video IF Coil Shunt
R33	330Ω 20%	1		BTS-330	2nd. Video IF Amp. Decoupling
R34	12KΩ	1		BTS-12K	3rd. Video IF Amp. Grid
R35	68Ω	1			3rd. Video IF Amp. Cathode
R36	8200Ω	1		BTS-8200	4th. Video IF Coil Shunt
R37	220Ω	1		BTS-220	4th. Video IF Amp. Cathode
R38	330Ω 20%	1		BTS-330	4th. Video IF Amp. Screen
R39	5600Ω	1	66-2564340	BTA-5600	4th. Video IF Amp. Plate
R40	330KΩ	1		BTS-330K	AGC Diode Load
R41	100KΩ 20%	1		BTS-100K	AGC Network
R42	330Ω	1		BTS-330	AGC Network
R43	3300Ω	1		BTS-3300	Video Det. Load
R44	8.2Meg 20%	1		BTS-8.2Meg	Bias Network
R45	1.2Meg	1		BTS-1.2Meg	Video Amp. Grid
R46	91Ω	1			Video Amp. Cathode -Wire Wound - See Note 2
R47	2700Ω	1		BTS-2700	Video Amp. Plate
R48	3300Ω	1		BTS-3300	Video Amp. Plate
R49	5600Ω	1		BTA-5600	Voltage Divider - See Note 3
R50	12KΩ	1		BTA-12K	Voltage Divider - See Note 4
R51	1.2Meg	1		BTS-1.2Meg	Bias Network
R52	1.8Meg 20%	1		BTS-1.8Meg	Video Output Grid
R53	2200Ω	1		BTS-2200	Video Output Cathode
R54	1800Ω	7	33-1335-102	1 3/4A-1750	Video Output Plate - Wire Wound
R55	1000Ω	1		BTS-1000	Voltage Divider
R56	470KΩ 20%	1		BTS-470K	Picture Tube Grid
R57	120KΩ 20%	1		BTS-120K	Picture Tube Cathode
R58	22KΩ	1		BTS-22K	Voltage Divider
R59	82KΩ 20%	1		BTS-82K	Voltage Divider
R60	120KΩ 20%	1		BTS-120K	1st. Sound IF Amp. Grid
R61	150Ω	1		BTS-150	1st. Sound IF Amp. Cathode
R62	1000Ω 20%	1		BTS-1000	1st. Sound IF Amp. Plate Decoupling
R63	680KΩ	1		BTA-680K	2nd. Sound IF Amp. Grid
R64	12KΩ	1	66-3124340	BTA-12K	2nd. Sound IF Amp. Decoupling
R65	22KΩ	1	66-3225340	BTA-22K	Voltage Divider
R66	33KΩ	1		BTS-33K	Ratio Det. Diode Load
R67	150KΩ	1		BTS-150K	Voltage Divider
R68	270Ω 20%	1		BTS-270	Balancing
R69	22KΩ 20%	1		BTS-22K	De-Emphasis
R70	10KΩ 20%	1		BTS-10K	Series Test Point
R71	47KΩ	1		BTS-47K	Tone Compensation
R72	15KΩ	1		BTS-15K	De-Emphasis
R73	10Meg 20%	1		BTS-10Meg	AF Amp. Grid
R74	270KΩ 5%	1		BTS-270K 5%	AF Amp. Plate
R75	470KΩ 20%	1		BTS-470K	Output Grid
R76	270Ω	1	66-1274340	BTA-270	Output Cathode
R77	5600Ω	1		BTS-5600	Decoupling
R78	1.2Meg	1		BTS-1.2Meg	1st. Sync. Separator Grid
R79	4700Ω	1		BTS-4700	1st. Sync. Separator Cathode - See Note 5
R80	220KΩ	1		BTS-220K	Series Test Point - See Note 6
R81	240KΩ 5%	1		BTS-240K 5%	Noise Limiter Plate - See Note 7
R82	39KΩ 5%	1		BTS-39K 5%	Voltage Divider
R83	5.6Meg	1		BTS-5.6Meg	AGC Network
R84	1Meg	1		BTS-1Meg	AGC Network - See Note 8
R85	270KΩ 20%	1		BTS-270K	2nd. Sync. Separator Grid
R86	100KΩ	1		BTS-100K	2nd. Sync. Separator Plate
R87	15KΩ	1		BTS-15K	Voltage Divider
R88	1Meg 20%	1		BTS-1Meg	Voltage Divider
R89	10KΩ 20%	1		BTS-10K	Sync. Phase Inv. Grid
R90	6800Ω	1	66-3225351	BTA-6800	Sync. Phase Inv. Plate
R91	8200Ω	1	66-2824340	BTA-8200	Sync. Phase Inv. Plate
R92	12KΩ	2	66-3125340	BTS-12K	Sync. Phase Inv. Plate Decoupling
R93	10KΩ 20%	1		BTS-10K	Integrator Network
R94	4700Ω	1		BTS-4700	Integrator Network
R95	4700Ω	1		BTS-4700	Integrator Network
R96	4700Ω	1		BTS-4700	Differentiator
R97	180 KΩ	1		BTS-180K	Vert. Osc. Grid
R98	15KΩ 20%	1		BTS-15K	Vert. Osc. Transformer Shunt
R99	1.8Meg	1		BTA-1.8Meg	Vert. Osc. Plate - See Note 9
R100	680Ω	1		BTS-680	Vert. Peaking
R101	1Meg 20%	1		BTS-1Meg	Vert. Output Grid
R102	22KΩ 20%	2	66-3224340	BTB-22K	Vert. Output Screen
R103	220KΩ	1		BTA-220K	Voltage Divider
R104	18KΩ	2	66-3185340	BTB-18K	Voltage Divider
R105	3.3Meg	1		BTS-3.3Meg	Voltage Divider
R106	1.2Meg	1		BTS-1.2Meg	Horiz. AFC Grid
R107	390KΩ 5%	1		BTS-390K 5%	Horiz. Osc. Grid
R108	470KΩ 20%	1		BTS-470K	Horiz. AFC Cathode
R109	8200Ω	1		BTS-8200	Horiz. AFC Filter
R110	390KΩ 5%	1		BTS-390K 5%	Horiz. Osc. Grid
R111	82KΩ	1		BTS-82K	Voltage Divider
R112	12KΩ	1	66-3125340	BTS-12K	Voltage Divider
R113	18KΩ	2		BTS-18K	Horiz. Osc. Coil Shunt
R114	47KΩ	1		BTA-47K	Horiz. Osc. Plate

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
R115	180KΩ	½		BTS-180K	Horiz. AFC Feedback
R116	470KΩ 20%	½		BTS-470K	Horiz. Output Grid
R117	47Ω 20%	1			Parasitic Suppressor
R118	10KΩ	5	33-1335-109	1 3/4A-10K	Horiz. Output Screen - Wire Wound - See Note 10
R119	10KΩ	5	33-1335-109	1 3/4A-10K	Horiz. Output Screen - Wire Wound - See Note 4
R120	10KΩ	2	66-3105340	BTB-10K	ACC Anode Load
R121	1000Ω	½	66-3275340	BTS-1000	Anti Ringing Coil Shunt - See Note 11
R122	68KΩ	1	66-3684340	BTA-68K	Voltage Divider
R123	47KΩ	1		BTA-47K	Voltage Divider
R124	2.5Meg	1	33-1351-7		HV Rectifier Load
R125	2.5Meg	1	33-1351-7		HV Rectifier Load
R126	7.5Ω	15	33-3448		Surge Limiter - Wire Wound
R127	1550Ω	12	33-3435-34	2D-1500	Voltage Divider - Wire Wound
R128	68Ω	½			Surge Limiter
R129	10KΩ 20%	½		BTS-10K	Filter
R130	220KΩ	1		BTA-220K	Bias Network
R131	100KΩ	½		BTS-100K	Bias Network
R132	10Ω 20%	½			Series Dial Light
R133	.24Ω				Series Filament - See Note 12
R134	470KΩ	1	66-4474340	BTA-470K	Picture Tube Mask Isolation

Note 1. Some models use a 1Meg Resistor in this application.
Note 2. Some models use a 100Ω Resistor in this application.
Note 3. Some models use a 3900Ω Resistor in this application.
Note 4. Not used in all models.
Note 5. Some models use a 10KΩ resistor in this application.
Note 6. Some models use a 47KΩ Resistor in this application.
Note 7. Some models use a 180KΩ Resistor in this application.
Note 8. Some models use a 1.2Meg Resistor in this application.
Note 9. Some models use a 1.5Meg Resistor in this application
Note10. Some models use a 5100Ω Resistor in this application.
Note 11. Some models use a 27KΩ Resistor in this application.
Note 12. This Resistor is made from #24 Wire, 15" long.
■ Items R11, C11 are combined in one unit.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ② 1.9A	24VAC ② .0002 ADC	② 11.9 A. AC		32-8512			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	170Ω	325Ω	32-8431-3 32-8431-2 ①			T80-4	Vert. Osc. Trans.
T3	340Ω Tap ② 40Ω, 63Ω	0Ω SEC. 2 0Ω 14Ω	32-8534 32-8533 ②				Horiz. Output Trans.
T4	310Ω		32-8515				Vert. Output Trans.
T5A	22Ω		76-7188	DY9	MDF70		Horiz. Deflection Coils
B	49Ω						Vert. Deflection Coils.

① Alternate Vert. osc. trans.
② Alternate Horiz. output trans.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	10KΩ	3.5Ω	420Ω	.7Ω	32-8242-11	A3879 ③	A-3019	RO-16 ③	③ Drill one new mtg. hole

SPEAKER

ITEM No.	RATINGS	REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	FIELD. RES. PM; V. C. IMP. 3.5Ω	36-1641-6 36-1610-9 ①	ST-108 Mod. P6-X	6A1	① Alternate EM Speaker
SP1B	CONE DIA. 6"; V. C. DIA. 9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 MA)	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.310A=	45Ω	2.5H	32-8514	C2326 ①	C2996 ①	TR-3300	① Drill one new mtg. hole

PHILCO MODELS 52-T2106, 52-T2108, 52-T2110, 52-T2140, 52-T2144, 52-T2244

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L2	Ant. Trans.	.6Ω	.6Ω			Part of Tapered-Line Assy. Part #76-7071
L3	Ant. Trans.	.6Ω	.6Ω			Part of Tapered-Line Assy. Part #76-7071
L4	FM Trap	0Ω				Part of Tapered-Line Assy. Part #76-7071
L5	Ant. Coils	0Ω		76-7077		Switch Wafer With Coils
L6	150Ω Coiled Line	0Ω	.5Ω	32-4527		
L7	Fil. Choke	0Ω		32-4112-2		
L8	Fil. Choke	.2Ω		312-5132		
L9	RF Choke	.4Ω		32-4112-22		
L10	RF Coils	0Ω		76-6895		Switch Wafer With Coils
L11	Mixer Grid Coils	0Ω		76-7098		Switch Wafer With Coils
L12	Fil. Choke	.1Ω		32-4112-2		
L13	Fil. Choke	0Ω		32-4112-2		
L14	Cath. Choke	.2Ω		32-4112-25		
L15	Osc. Coils	0Ω		76-6784		Switch Wafer With Coils
L16	1st. Video IF	.4Ω		32-4359-12		Tap ⓐ .2Ω
L17	2nd. Video IF	.2Ω		32-4486		
L18	28.1MC Trap	0Ω		32-4303-3		
L19	Fil. Choke	.1Ω		32-4212-15		
L20	3rd. Video IF	.2Ω		32-4486		
L21	21.85MC Trap	.1Ω		32-4496		
L22	RF Choke	.1Ω		32-4112-15		
L23	4th. Video IF	.2Ω	.2Ω	32-4486-6		
L24	5th. Video IF	.2Ω		32-4486		
L25	Fil. Choke	.1Ω		32-4412-15		
L26	Peaking Coil	1.8Ω		32-4143-16		40 Microhenries
L27	Peaking Coil	3.6Ω		32-4143-17		100 Michrohenries
L28	4.5MC Trap	1.8Ω		32-4463-2		
L29	Video Amp. Grid Coil	.3Ω		32-4143-18		
L30	Peaking Coil	5.4Ω		32-4480-15		220 Microhenries
L31	Variable Peaking Coil	5.3Ω		32-4467-7		57 to 165 Microhenries
L32	Sound IF	4.7Ω		32-4449A		
L33	Ratio Det.	5.2Ω	.8Ω	32-4450-5		Tap ⓐ 1.2Ω
L34	Fil. Choke	.1Ω		32-4112-15		
L35	Horiz. Osc.	23Ω	58Ω	32-8551		Stabilizer Winding 58Ω
L36	Anti-Ringing Coil	4.2Ω		32-4480		180 Microhenries
L37	RF Choke	2Ω		32-4112-24		
L38	RF Choke	2Ω		32-4112-24		

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA PHILCO PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	NOTES
M1	.310A	34-8003-8	NH-5	6QS2	1021A	
M2	.310A	34-8003-8	NH-5	6QS2	1021A	
M3	.0002A	34-8003-9			5A2P	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA PHILCO PART No. FUSE	PHILCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M4	3AG Slo-Blo Pigtail	2A. 125V.	45-2656-23		315002		MDV2	
M5			Piece of #26 Wire					
M6			Piece of #26 Wire					

DIAL LIGHTS

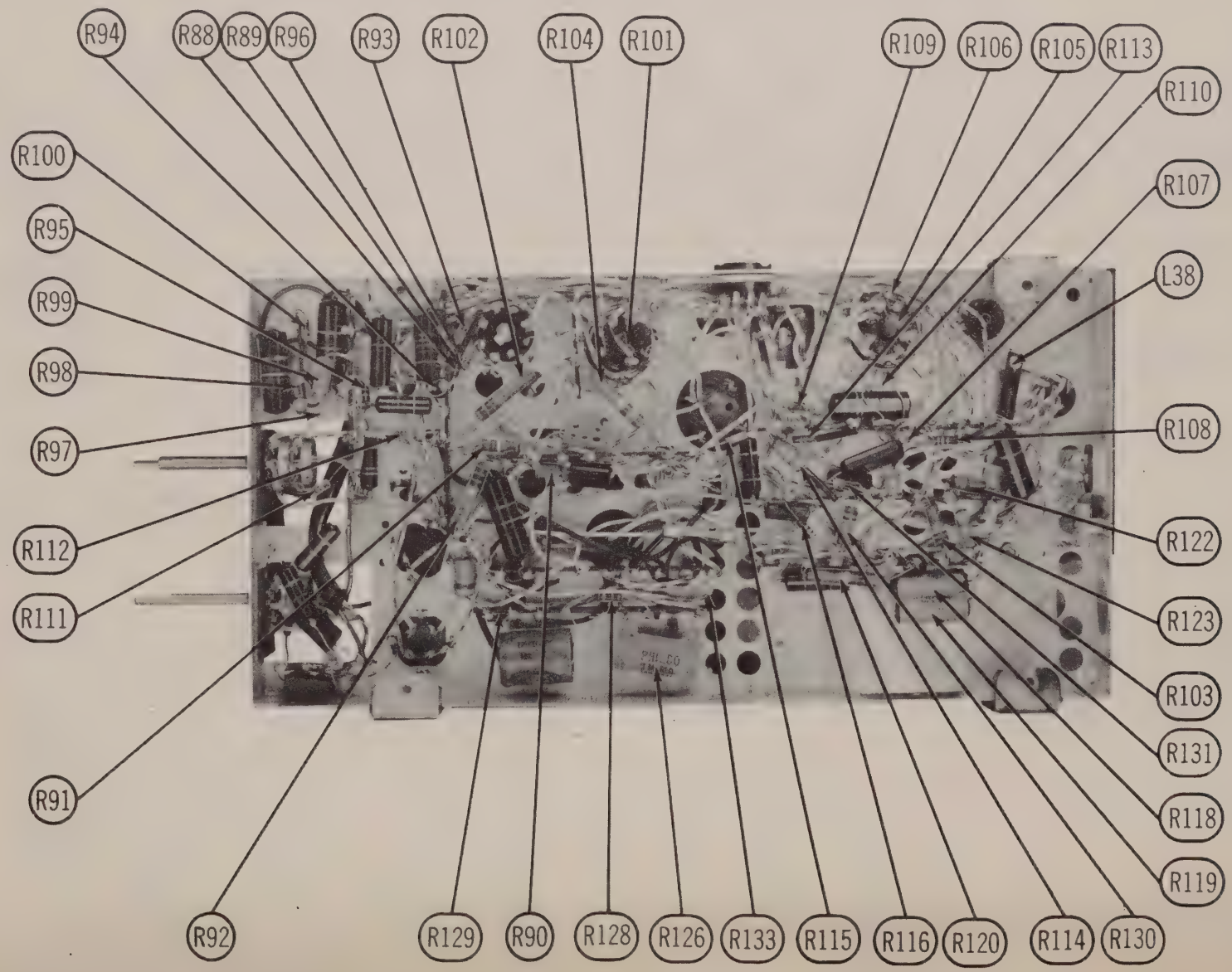
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA PHILCO PART No.		NOTES
M7	Bayonet	6-8	.15	Brown			Type #47

MISCELLANEOUS

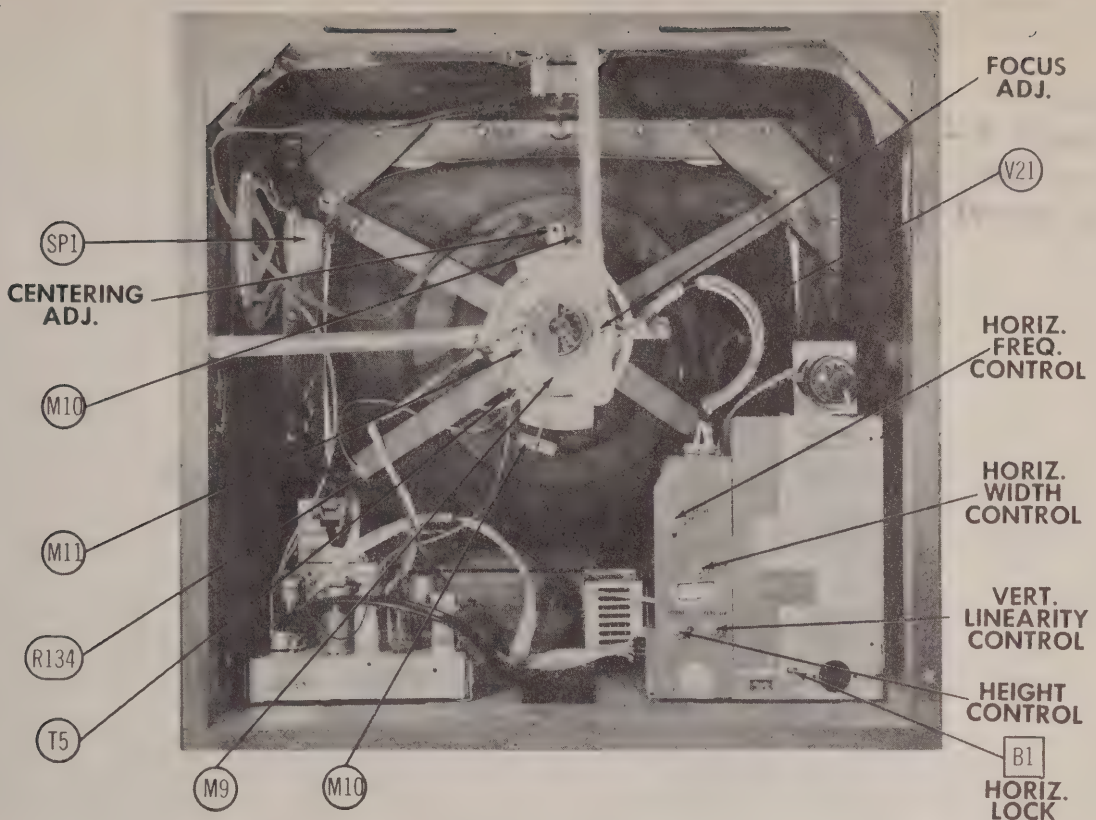
ITEM No.	PART NAME	PHILCO PART No.	NOTES
M8	RF Tuner	76-7070	
M9	Focus Magnet	76-6126-4	
M10	Magnets	76-6594	Anti-pin cushion corrector (2 Required)
M11	Ion Trap	76-6077-2	
B1	Trimmer	31-6473-32	Horiz. Lock(45-370MMF)
	Knob	54-4750	Ant.
	Knob	54-4799	Brightness & Vert. Hold
	Knob	76-6046	Channel Selector
	Knob	76-6048	Contrast & Horiz. Hold
	Knob	76-6104	Fine Tuning
	Knob	76-6581-1	OFF/ON Volume

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SWEEP CHASSIS-CAPACITOR IDENTIFICATION



SWEEP CHASSIS-RESISTOR IDENTIFICATION



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

If normal adjustment of the horizontal hold control fails to maintain horizontal sync adjust as follows:

Turn the horizontal hold control fully clockwise.

Adjust the horizontal frequency control until 4 diagonal black bars appear, sloping to the right.

Turn the horizontal hold control counter clockwise until the picture comes in, then out, of sync. If necessary, momentarily turn to another channel to throw picture out of sync.

Then turn the horizontal hold control slowly clockwise and note the least number of black bars appearing just before the picture falls into sync.

Adjust the horizontal lock-in trimmer (B1) for 3 bars just before synchronization.

If above adjustments do not give satisfactory synchronization it may be necessary to adjust the horizontal stabilizing slug (B2). Connect an oscilloscope through a 15MMF capacitor to pin 6 (cathode) of 6SN7 (V16). Adjust B2 for a curve similar to Fig. 6. The average line of the scope is established by shorting the input leads of the scope. Points "A" should coincide with the average line of the scope.

Turn the horizontal hold control fully clockwise. Adjust the horizontal frequency control until 4 diagonal black bars appear, sloping to the right.

If 4 diagonal black bars cannot be obtained by adjusting the horizontal control as above, adjust the horizontal oscillator core (B3) for the desired result.

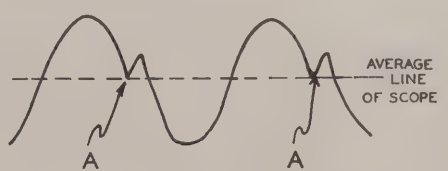
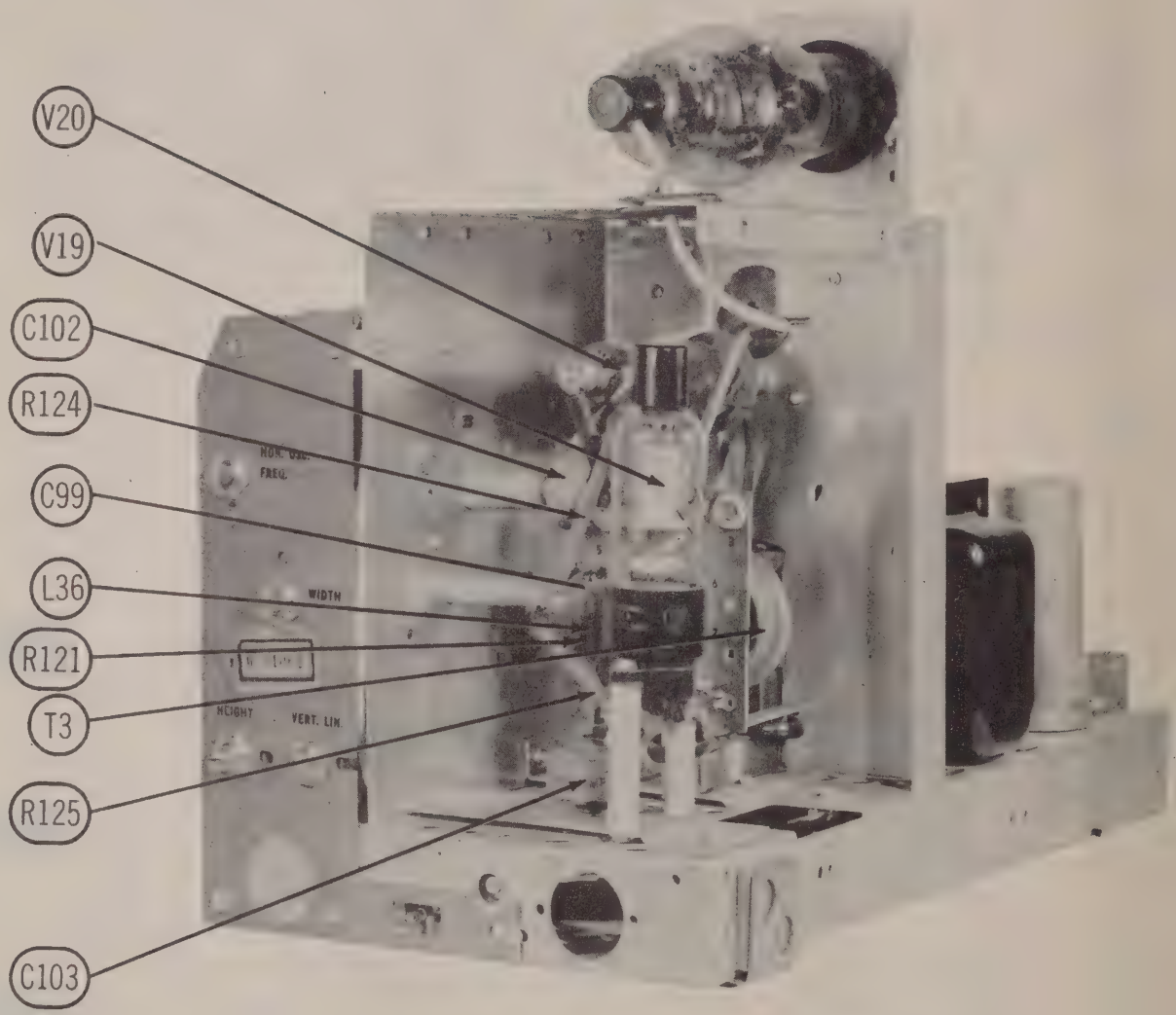
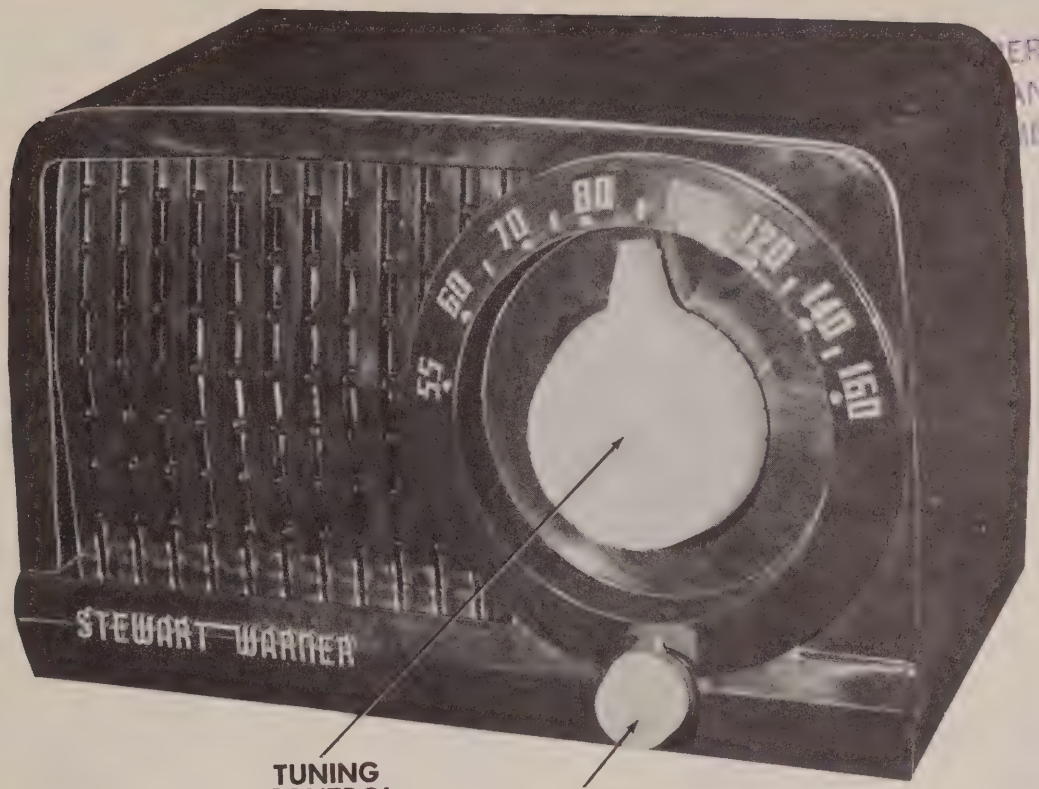


FIG. 6



SWEEP CHASSIS – TOP VIEW

STEWART WARNER
MODELS 9160AU, BU, CU, DU, EU



STEWART WARNER
MODELS 9160AU, BU, CU, DU, EU

STEWART-WARNER MODEL 9160-AU

TRADE NAME	Stewart-Warner Models 9160-AU, 9160-BU, 9160-CU, 9160-DU, 9160-EU
MANUFACTURER	Stewart-Warner Elect., Div. of Stewart-Warner Corp., 1300 N. Kostner Ave., Chicago 15, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (FIVE)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC/DC — RATING .260 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	550-1650 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use an isolation transformer if available.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455 KC (400~ Mod)	Any point of non-interference.	Across voice coil	A1, A2 A3, A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1500 KC	1500 *	"	A5	Adjust for maximum output.
3.		"	1500 KC	Tune to 1500 KC signal	"	A6	"

* Replace chassis in cabinet, place pointer on shaft and set pointer to the 1500 mark on the dial. Then remove pointer and chassis, being careful not to disturb the setting of the tuning gang, and proceed with the alignment.

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PARTS LIST AND DESCRIPTIONS

STEWART-WARNER
MODEL 9160-AU

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Stewart-Warner PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Stewart Warner PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	50	150	509837	PRS150/50-30		EDL-5315		TVA-2450	Filter (Red)
B	30	150							Filter (Blue)
C2	33		513028	SI33	D6-330		GP1K-330	5GA-Q33	Osc. Grid Cap.
C3	.05	400	512028	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C4A	220		♦509836		♦PC-150				Diode RF Filter
B	.002								Audio Coupling
C	.005								Audio Coupling
D	250								AF Amp. Plate Bypass
E									Audio Output Grid
C5	.02	400	512016	P488-02	DF-203	PTE4S2		4TM-S2	Audio Output Plate
C6	.05	400	512028	P488-05	DF-503	PTE4S5		4TM-S5	Rectifier Plate
R7	.15	400	512040	P488-15		PTE4P15		4TM-P-5	Line Isolation

♦ Items C4A, C4B, C4C, C4D, C4E, R5A, R5B, R5C are combined in one unit.
When replacing items separately C4D and C4E should total 250MMF.

CONTROLS

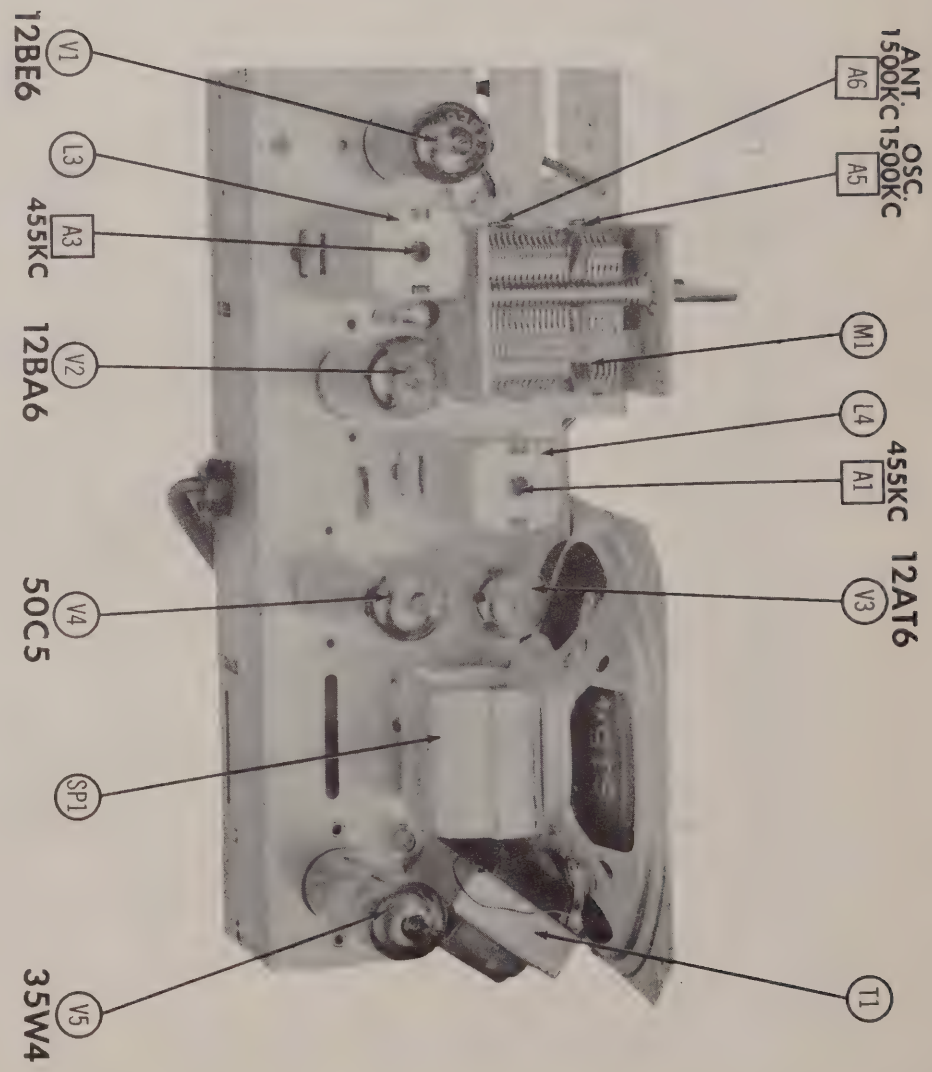
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Stewart Warner PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	509830	Q13-137	AG-63-Z	BSK-70-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Stewart Warner PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	510161		Osc. Grid
R3	100Ω	½	510119	BTS-100	IF Amp. Cathode
R4	3.3Meg	½	510194	BTS-3.3Meg	AVC Network
R5A	6.8Meg	½	♦509836	BTS-6.8Meg	AF Amp. Grid
B	470KΩ	½		BTS-470K	AF Amp. Plate
C	470KΩ	½		BTS-470K	Output Grid
R6	150Ω	½	510122	BTS-150	Output Cathode
R7	1000Ω	1	510237	BTA-1000	Filter
R8	33Ω	½	510209		Filament Dropping

♦ Items R5A, R5B, R5C, C4A, C4B, C4C, C4D, C4E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Stewart Warner PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.5KΩ	3.9Ω	230Ω	.8Ω	509826	A-3332 ①	A-3025 ①	RO-2 ①	① Drill one new mtg. hole

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	Stewart Warner PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	3.9Ω	C-509828		4A07	
	CONE DIA.	V. C. DIA.				
SP1B	4"	9/16"				

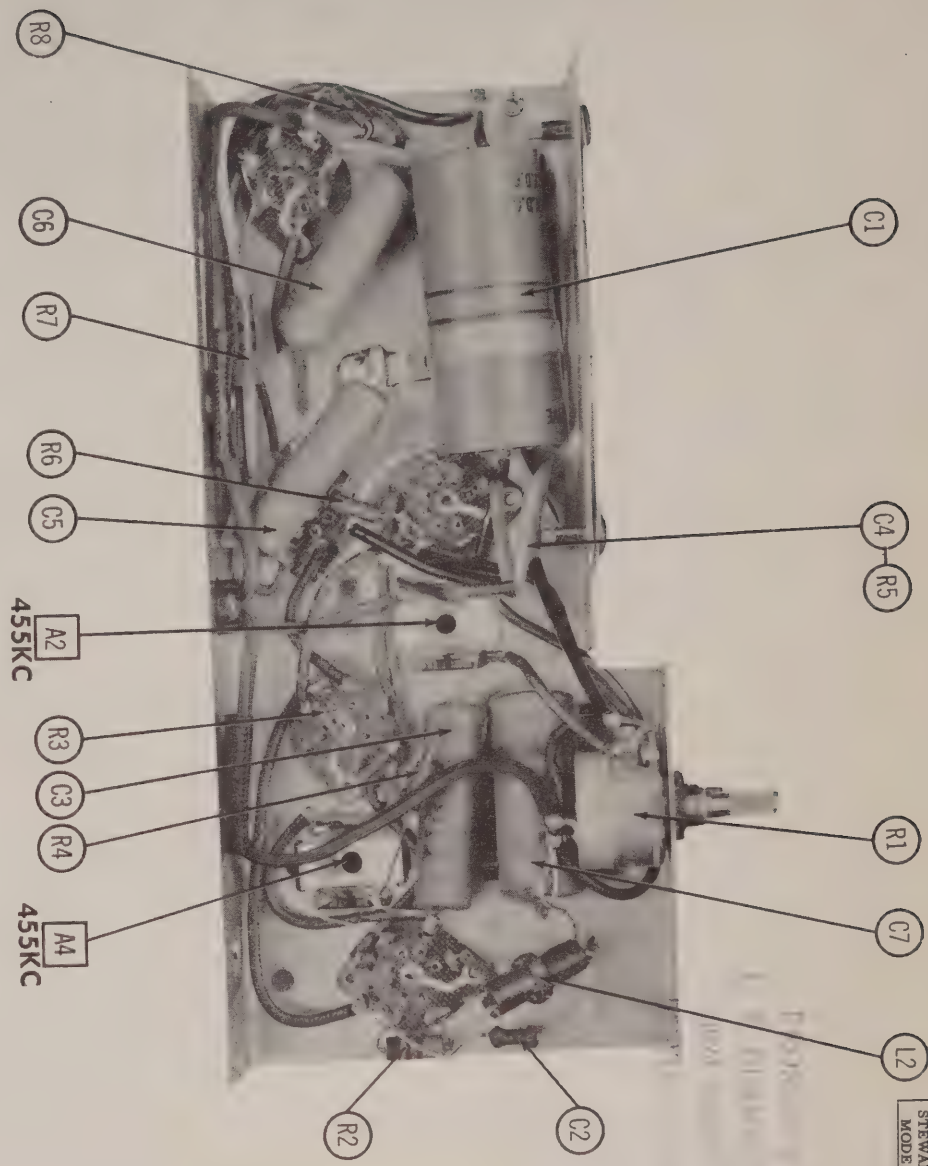
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Stewart Warner PART No.	MERIT PART No.	
L1	Loop Ant.	3.2Ω		509833		
L2	Osc. Coil	.8Ω	10Ω	509832	*BC-397	* Drill mounting hole
L3	Input IF	17Ω	17Ω	509433	BC-352	
L4	Output IF	17Ω	17Ω	509433	BC-353	

MISCELLANEOUS

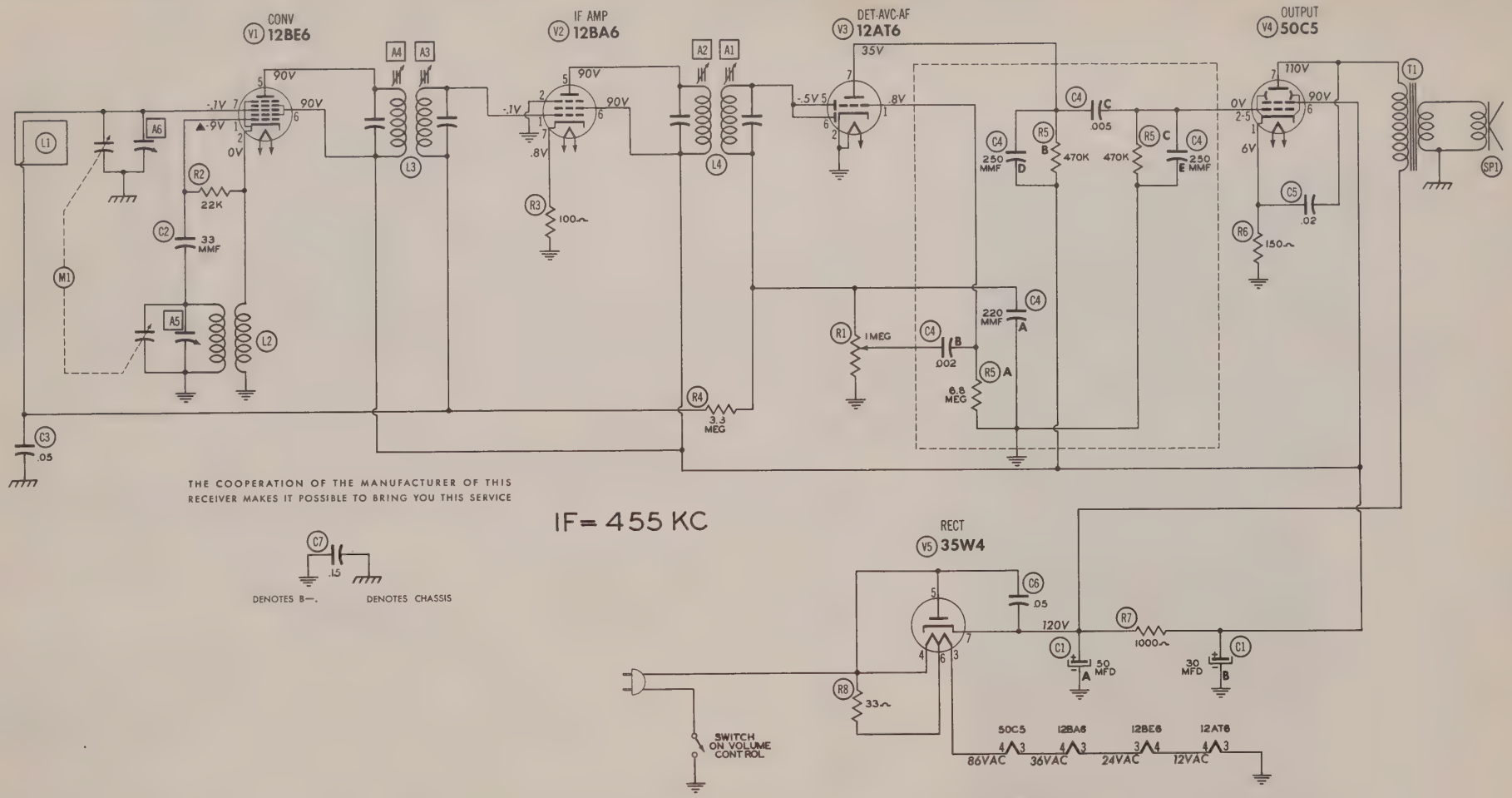
ITEM No.	PART NAME	Stewart Warner PART No.	NOTES
M1	2 Gang Var. Cap.	509827	(27-404MMF, 15-150MMF)
	Cabinet	509840-A	Model 9160-AU (Mahogony)
	Cabinet	509840-B	Model 9160-BU (Yellow)
	Cabinet	509840-C	Model 9160-CU (Blue)
	Cabinet	520342	Model 9160-DU (Rust)
	Cabinet	520343	Model 9160-EU (Tan)
	Knob	509839-A	Tuning -Models 9160-AU & 9160-DU (Tan)
	Knob	509839-B	Tuning -Model 9160-BU (Green)
	Knob	509839-C	Tuning -Model 9160-CU (Blue)
	Knob	509839-E	Tuning -Model 9160-EU (Rust)
	Knob	509841-A	Volume-Models 9160-AU & 9160-DU (Tan)
	Knob	509841-B	Volume-Model 9160-BU (Green)
	Knob	509841-C	Volume -Model 9160-CU (Blue)
	Knob	509841-E	Volume- Model 9160-EU (Rust)

CHASSIS—BOTTOM VIEW



SET 171 FOLDER 10

STEWART-WARNER MODEL 9160-AU



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF= 455 KC

DENOTES B—. DENOTES CHASSIS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.8Ω	24Ω	12Ω	†1KΩ	†1KΩ	4.3Meg
V 2	12BA6	4.3Meg	0Ω	24Ω	36Ω	†1KΩ	†1KΩ	100Ω
V 3	12AT6	6.8Meg	0Ω	0Ω	12Ω	1Meg	1Meg	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	†230Ω
V 5	35W4	60KΩ	60KΩ	86Ω	121Ω	103Ω	103Ω	60KΩ

† MEASURED FROM PIN 7 OF V5
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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171-10

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

TRAV-LER MODELS 217-10, -11, -12, -14, 220-9, A, B (Ch. 33A2)

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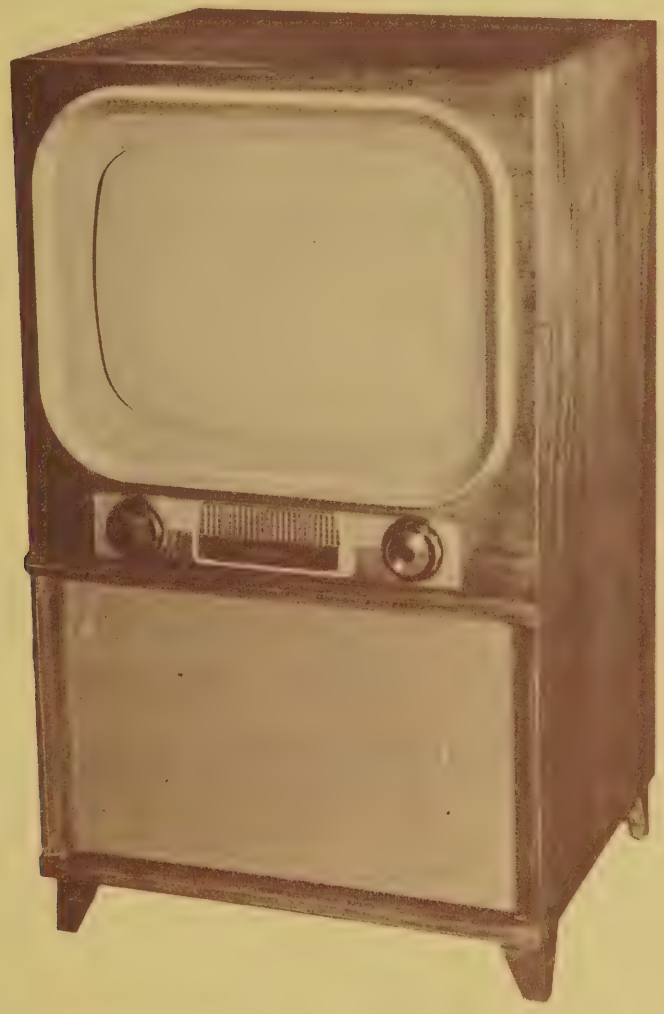

MODEL 220-9A

TRAV-LER MODELS 217-10, -11, -12, -14, 220-9, A, B (Ch. 33A2)

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DATE 6-52 SET 171 FOLDER 11

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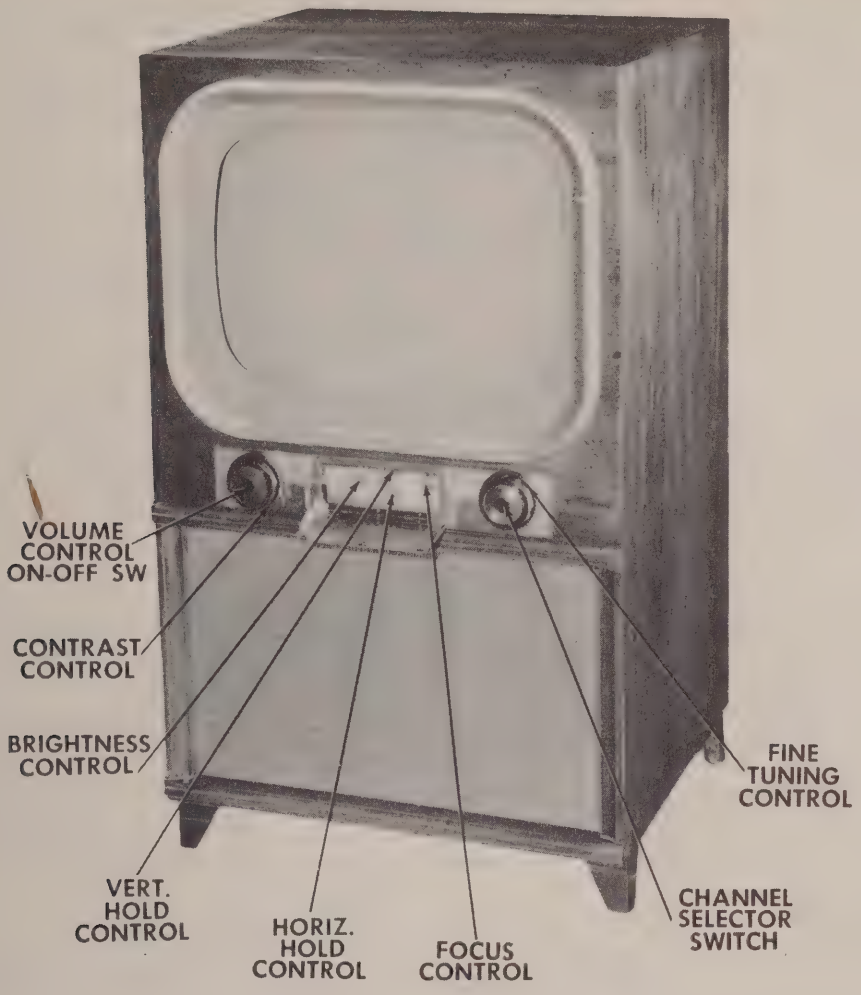

TRAV-LER MODELS 217-10, -11, -12, -14, 220-9, A, B (Ch. 33A2)

TRAV-LER 220-9A

TRADE NAME	Trav-ler Models 217-10, 217-11, 217-12, 217-14, 220-9, 220,-9, 220-9A, 220-9B (Ch. 33A2)
MANUFACTURER	Trav-ler Radio and Tel. Corp., 571 W. Jackson Blvd., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-one
POWER SUPPLY	110-120 Volts AC-60 cycle — RATING 1.6 Amp. @ 117 volts AC
TUNING RANGE	Channel 2 thru 13

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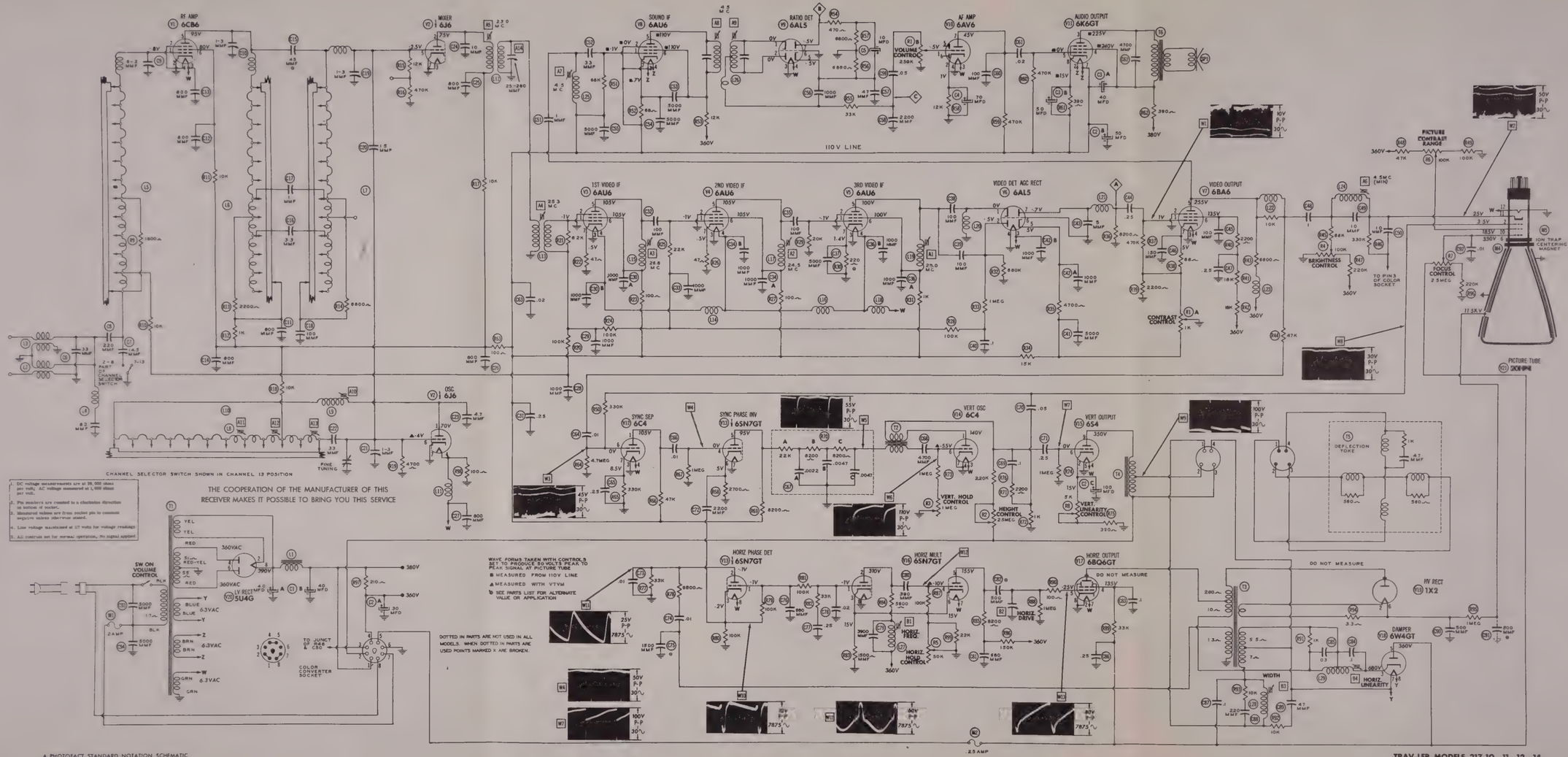
RF AMP 6CB6
MIXER 6J6
OSC 6J6
SOUND IF 6AU6
RATIO DET 6AL5
AF AMP 6AV6
AUDIO OUTPUT 6K6GT
1ST VIDEO IF 6AU6
2ND VIDEO IF 6AU6
3RD VIDEO IF 6AU6
VIDEO DET AGC RECT 6AL5
VIDEO OUTPUT 6BA6
SYNC SEP 6C4
SYNC PHASE INV 6SN7GT
VERT OSC 6C4
VERT OUTPUT 6S4
HORIZ PHASE DET 6SN7GT
HORIZ MULT 6SN7GT
HORIZ OUTPUT 6BQ6GT
LV RECT 5U4G
HV RECT 1X2
DAMPER 6W4GT
PICTURE TUBE 20CP4
110V LINE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 90 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DO NOT MEASURE
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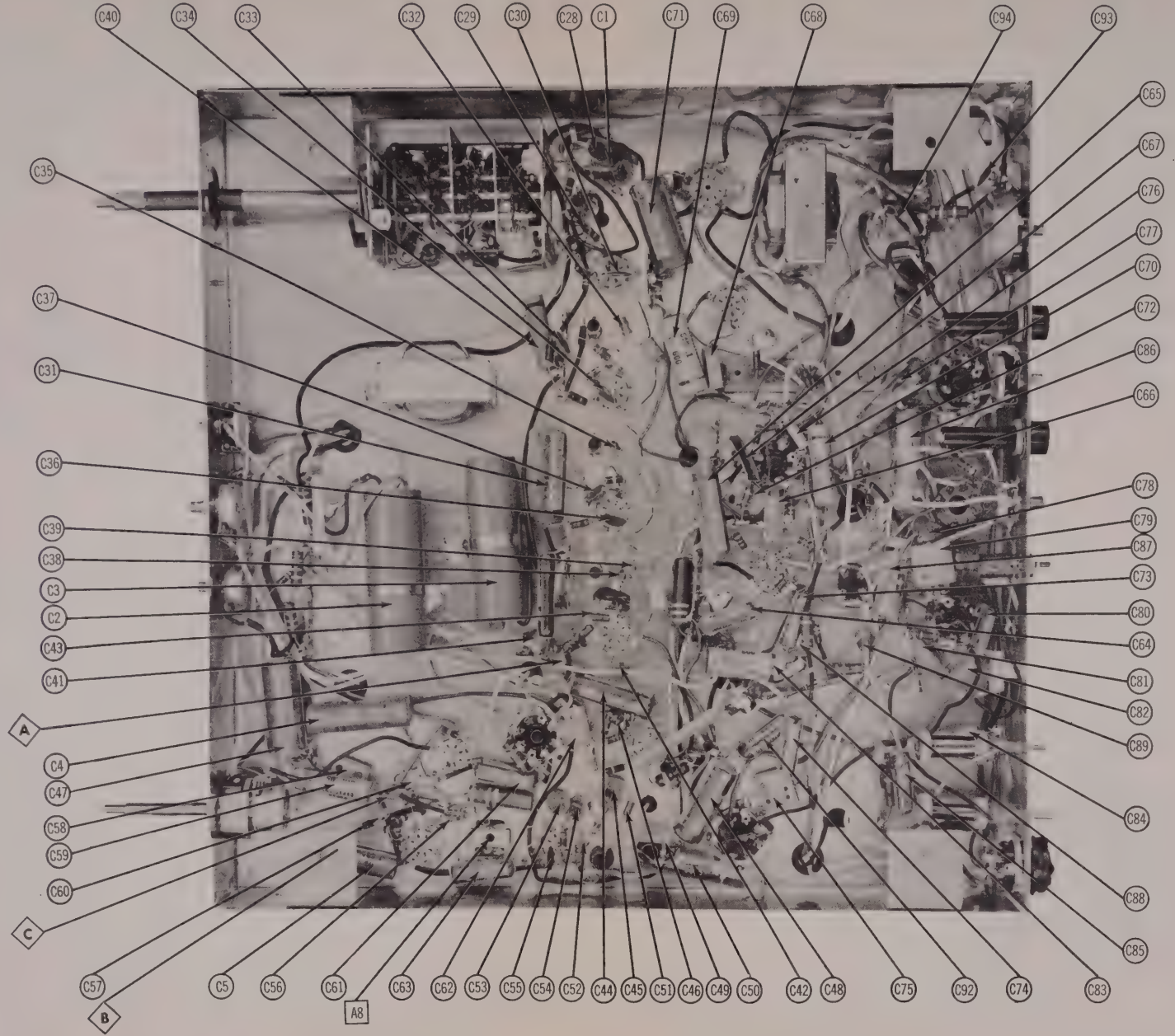
TRAV-LER MODELS 217-10, -11, -12, -14, 220-9, A, B (Ch. 33A2)

TRAV-LER MODELS 217-10, -11, -12, -14, 220-9, A, B (Ch. 33A2)

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION

TOP VIEW

BOTTOM VIEW

TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C40. Connect the positive lead to chassis. Remove the converter tube, V2, from its socket and replace with a dummy 6J6 from which pin 1 has been clipped. This will disable the oscillator section and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25 MC (Unmod.)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	24.5 MC	"	"	A2	"
3.	"	"	26.6 MC	"	"	A3	"
4.	"	"	25.3 MC	"	"	A4	"
5.	"	"	23.0 MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24 MC (10 MC Swp)	21.75 MC 26.25MC	Any	Vert. amp. to point (A) Low side to chassis.		Check for response curve similar to fig. 1 with 26.25 MC at 50% response and 21.75 MC at not more than 10%. If necessary readjust A1 thru A5 for desired response. Adjust A14 for desired band width and and flat top response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to point (A). Low side to chassis.	4.5 MC (Unmod.)	Any not used locally.	DC probe thru detector, see Fig. 2, to pin 11 of picture tube, Common to chassis.	A6	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5 MC (Unmod.)	Any not used locally.	DC probe to point (B). Common to chassis.	A7, A8	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point (C). Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to point (A). Low side to chassis.	4.5 MC (450KC swp.)	4.5 MC	Any not used locally.	Vert. amp. to point (B) Low side to chassis.	A7, A8	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per fig. 3.
9.	"	"	"	"	"	Vert. amp. to point (C) Low side to chassis.	A9	Reconnect capacitor C5. Adjust A9 so that 4.5 MC occurs at center of crossover lines as per fig. 4. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

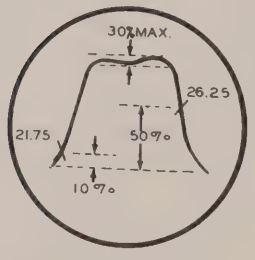


FIG. 11

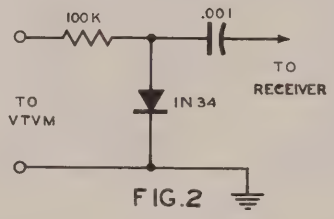


FIG. 2

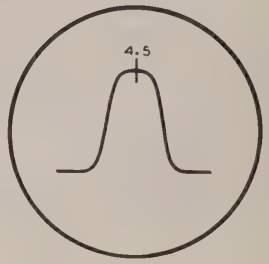


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213 MC (10 MC Swp)	211.25 MC 215.75 MC	13	Vert. amp. to point (A) Low side to chassis.	A10	Adjust to place video marker at 50% on response curve as per fig. 5.
11.	"	"	207 (10 MC Swp)	205.25MC 209.75 MC	12	"		Check all high band channels to see if video marker can be properly placed well within the range of the fine tuning control. If not make compromise adjustment of A10.
			201 (10 MC Swp)	199.25 MC 203.75 MC	11			
			195 (10 MC Swp)	193.25 MC 197.75 MC	10			
			189 (10 MC Swp)	187.25 MC 191.75 MC	9			
			183 (10 MC Swp)	181.25 MC 185.75 MC	8			
			177 (10 MC Swp)	175.25 MC 179.75 MC	7			
12.	"	"	85 MC (10 MC Swp)	83.25 MC 87.75 MC	6	"	A11	Adjust to place video marker at 50% on response curve as per fig. 5.
13.	"	"	79 MC (10 MC Swp)	77.25 MC 81.75 MC	5	"		Check to see that video marker can be correctly placed with the fine tuning control. If not, make compromise adjustment of A11.
14.	"	"	69 MC (10 MC Swp)	67.25 MC 71.75 MC	4	"	A12	Adjust to place video marker at 50% on response curve as per fig. 5 .
15.	"	"	63 MC (10 MC Swp)	61.25 MC 65.75 MC	3	"		Check to see that video marker can be correctly placed with the fine tuning control. If not, make compromise adjustment of A12.
16.	"	"	57 MC (10 MC Swp)	55.25 MC 59.75 MC	2	"	A13	Adjust to place video marker at 50% on response curve as per fig. 5

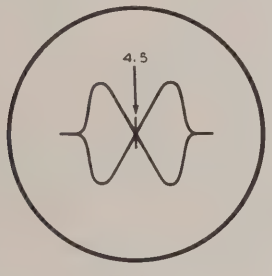


FIG. 4

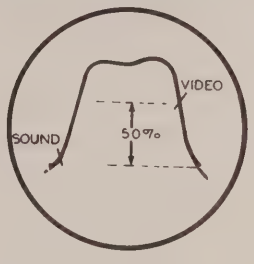


FIG.5

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8 ·	Pin 9
V 1	6CB6	2Meg	0Ω	.1Ω	0Ω	■1.1KΩ	■10KΩ	0Ω		
V 2	6J6	■10KΩ	■10KΩ	0Ω	.1Ω	480KΩ	4.7KΩ	0Ω		
V 3	6AU6	1.9Meg	0Ω	0Ω	.1Ω	■100Ω	■100Ω	47Ω		
V 4	6AU6	1.8Meg	0Ω	0Ω	.1Ω	■100Ω	■100Ω	47Ω		
V 5	6AU6	22KΩ	0Ω	0Ω	.1Ω	■1KΩ	■1KΩ	220Ω		
V 6	6AL5	3.4Ω	880KΩ	.1Ω	0Ω	5.3KΩ	0Ω	8.2KΩ		
V 7	6BA6	470KΩ	0Ω	0Ω	.1Ω	†7KΩ	†38KΩ	350Ω		
V 8	6AU6	■68KΩ	■0Ω	■0Ω	■.4Ω	†12KΩ	†12KΩ	■68Ω		
V 9	6AL5	INF	INF	0Ω	.1Ω	6.8KΩ	0Ω	7.2KΩ		
V 10	6AV6	25KΩ	12KΩ	.1Ω	0Ω	INF	INF	■470KΩ		
V 11	6K6GT	INF	■4Ω	†900Ω	†448Ω	■470KΩ	■0Ω	■0Ω	■390Ω	
V 12	6C4	■47KΩ	INF	0Ω	.1Ω	■47KΩ	4.7Meg	330KΩ		
V 13	6SN7GT	200KΩ	33KΩ	100KΩ	1Meg	■8.2KΩ	2.7KΩ	0Ω	.1Ω	
V 14	6C4	†1.1Meg	INF	.1Ω	0Ω	†1.1Meg	1.5Meg	0Ω		
V 15	6S4	INF	1.3KΩ	1Meg	.1Ω	0Ω	1Meg	INF	INF	†1.4KΩ
V 16	6SN7GT	300KΩ	†5.9KΩ	1.5KΩ	110KΩ	†160KΩ	1.5KΩ	.1Ω	0Ω	
V 17	6BQ6GT	1Meg	0Ω	INF	†33KΩ	1Meg	INF	.1Ω	0Ω	TOP CAP #14Ω
V 18	6W4GT	INF	INF	INF	INF	†268Ω	INF	#7.4Ω	#7.5Ω	
V 19	1X2	PINS 1 THRU 9 HAVE INF RESISTANCE								TOP CAP #270Ω
V 20	5U4G	INF	30KΩ	INF	51Ω	INF	55Ω	INF	30KΩ	
V 21	20HP4	0Ω	660KΩ	PIN 6 †510KΩ	PIN 10 †70KΩ	PIN 11 85KΩ	PIN 12 .1Ω			

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V20
# MEASURED FROM PIN 3 OF V18
■ MEASURED FROM 110VDC LINE

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3924 MILLER ST.
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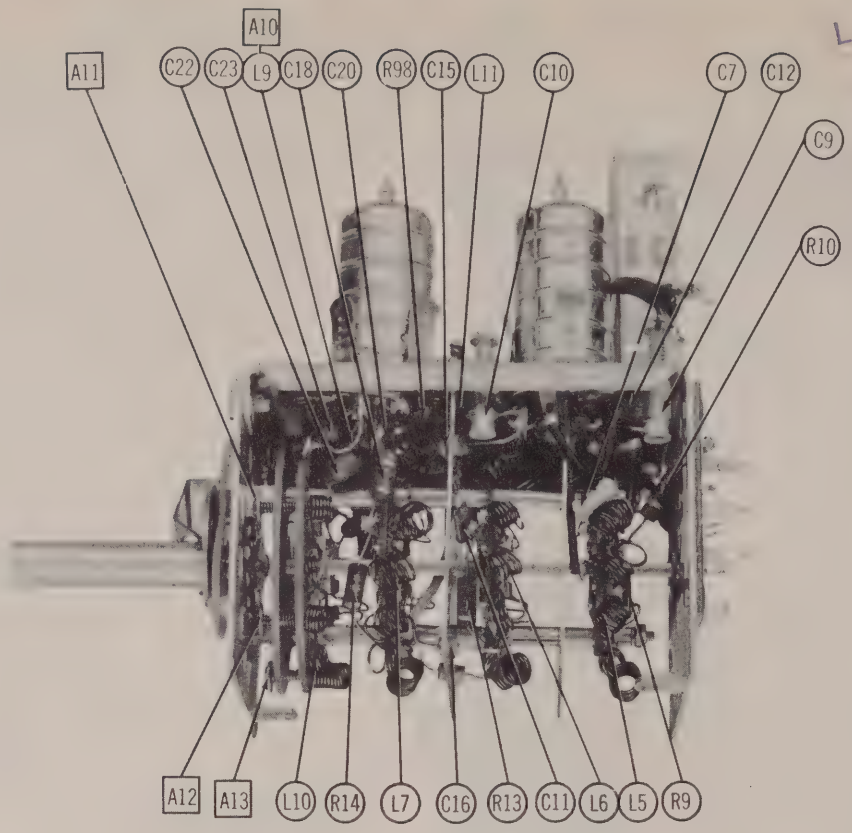
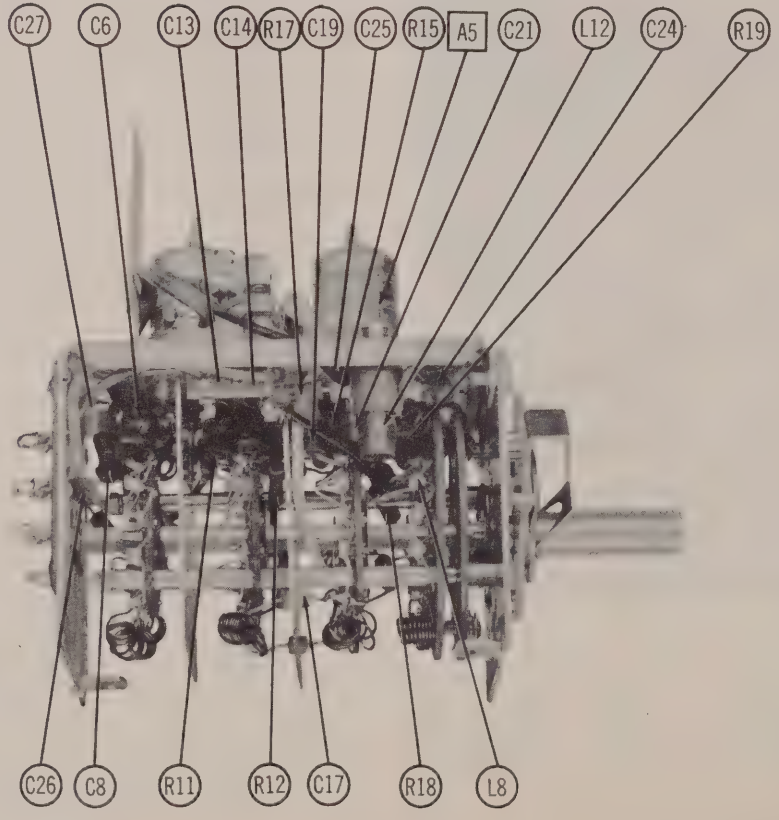
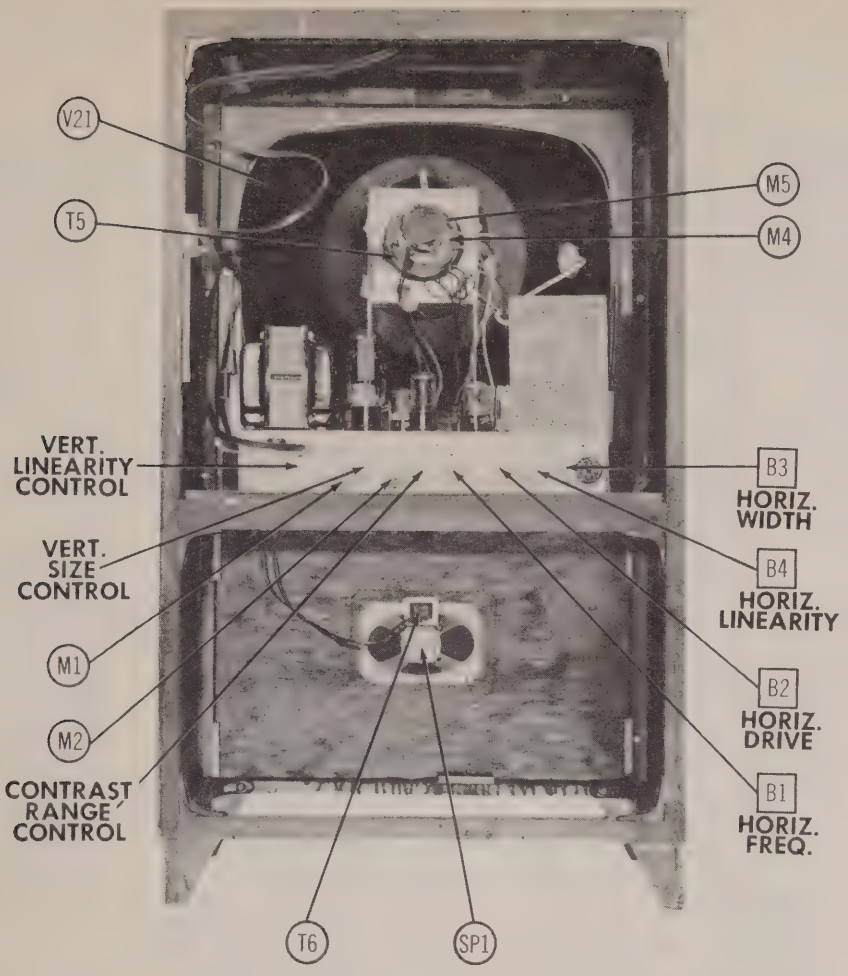


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL OSCILLATOR ADJUSTMENTS

Turn the set on and tune in a TV Station, preferably a test pattern. Set the horizontal hold control at the center of its range. If picture does not synchronize adjust the horizontal frequency slug, (B1) until picture is in sync.

Adjust the horizontal drive trimmer (B2) counter clockwise until picture starts to compress in center, then clockwise until compression just disappears.

Adjust the width slug (B3) until the picture is just a little wider than enough to fill the mask. Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 3 wood screws and 5 metal screws . Remove back cover.
3. Disconnect built-in antenna from antenna bracket and chassis.
4. Remove 2 wood screws and remove antenna braket from cabinet.
5. Disconnect speaker plug.
6. Remove 4 wood screws holding speaker. Remove speaker.
7. Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier		6CB6	7CM	
V2	Converter		6J6	9FB	
V3	1st Video IF Amp.		6AU6	7BK	
V4	2nd. Video IF Amp.		6AU6	7BK	
V5	3rd. Video IF Amp.		6AU6	7BK	
V6	Video Detector - AGC Rectifier		6AL5	6BT	
V7	Video Output		6BA6	7BK	
V8	Sound IF Amp.		6AU6	7BK	
V9	Ratio Detector		6AL5	6BT	
V10	AF Amplifier		6AV6	7BT	
V11	Audio Output		6K6GT	7S	
V12	Sync. Seperator		6C4	6BG	
V13	Sync. Phase Inv. - Horiz. Phase Det.		6SN7GT	7BD	
V14	Vert. Oscillator		6C4	6BG	
V15	Vert. Output		6B4	9AC	
V16	Horiz. Mult.		6SN7GT	8BD	
V17	Horiz. Output		6BQ6GT	6AM	
V18	Damper		6W4GT	4CG	
V19	HV Rectifier		1X2	9Y	
V20	LV Rectifier		1X2	9Y	
V21	LV Rectifier		5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V21A	20HP4A	20HP4A	12C	
B	20HP4	20HP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH2-57		UPT4445		TVL-2734	▲ Filter
B	40	450							▬ Filter
C2A	30	450		PRS450/40-40		UPT300		TVL-3708	Decoupling (Red)
B	50	150		PR825/100					Decoupling (Green)
C	100	25							Vert. Output Cathode (Blue)
C3A	40	450		PR5450/40		BR4045A		TVA-1712	Audio Output Dec. (Red)
B	50	50		PR550/50		BR505		TVA-1308	Audio Output Cathode (Green)
C4	70	10		PR825/100		BRH121		TVA-1130	AF Amp. Cathode
C5	10	50		PR850/10		BR105		TVA-1304	Stabilizing Cap.
C6	33			SI33	D6-330		GP1K-330	5GA-Q33	Fixed Trimmer
C7	14.5						NP0K-14R5		Fixed Trimmer
C8	220			SI220	D6-221		GP2K-221	5GA-T22	RF Coupling
C9	.6-2				829-3				Variable Trimmer
C10	1-3				829-3				Variable Trimmer
C11	800			BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Amp. Plate Dec.
C12	800			BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Amp. Screen Bypass
C13	800			BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Amp. Fil. Bypass
C14	800			BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Bypass
C15	.45						NP0K-R45		RF Coupling †
C16	3.3			SI3.3NP0	TCZ-3.3		NP0K-3R3		RF Coupling
C17	1				TCZ-1		NP0K-010		RF Coupling
C18	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	Mixer Grid Filter
C19	1-3				829-3				Variable Trimmer
C20	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		Osc. Coupling
C21	1-3				829-3				Variable Trimmer
C22	33				TCN-33		N750K-330	5TCU-Q33	Osc. Grid Cap.
C23	4.7						N750K-4R7		Fixed Trimmer
C24	10						N330K-100		Fixed Trimmer
C25	800			BPD-0008	DD-801	TM5T8	801-001	5HK-D1	Mixer Plate Dec.
C26	800			BPD-0008	DD-801	TM5T8	801-001	5HK-D1	RF Bypass
C27	800			BPD-0008	DD-801	TM5T8	801-001	5HK-D1	Fil. Bypass
C28	1000			BPD-001	DD-102	TM5D1	801-001	5HK-D1	AGC Filter
C29	1000			BPD-001	DD-102	TM5D1	801-001	5HK-D1	AGC Filter
C30A	1000			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	1st. Video IF Dec.
B	1000								1st. Video IF Fil.
C31	.25	600		684-25		PTE6P25		6TM-P25	RF Bypass
C32	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C33	1000			BPD-001	DD-102	TM5D1	GP2L-102	5HK-D1	AGC Filter
C34A	1000			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	2nd. Video IF Dec.
B	1000								2nd. Video IF Fil.
C35	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C36A	1000			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	3rd. Video IF Dec.
B	1000								3rd. Video IF Fil.
C37	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	3rd. Video IF Cathode
C38	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C39	100			SI100	D6-101	TM5T1	GP1K-101	5GA-T1	IF Coupling
C40	.1	200		P288-1	DF-104	PJ2P1		2TM-P1	AGC Filter
C41	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass
C42A	1000			BPD-2X001	DD-2-102	TM5DD1	812-001	5HK-2D1	AGC Rect. Cathode
B	1000								Video Det. Fil. Bypass
C43	5			SI5	TCZ-4.7	5W5V5	GP1K-050	MS-55	Video Det. Filter
C44	.25	200		P488-25		PJ2P25		4TM-P25	Video Coupling
C45	100	500		1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Video Output Screen
C46	150			SI150	D6-151	TM5T15	GP2K-151	5GA-T15	Video Output Cathode
C47	.25	800		684-25		PTE6P25		6TM-P25	RF Bypass
C48	.1	800		P688-1	DF-104	PTE6P1		6TM-P1	Video Coupling
C49	10	500		1469-00001		5R5Q1		MS-41	Fixed Trimmer
C50	10	500		1468-00001	D6-100	5W5Q1	GP1K-100	MS-41	Video Coupling
C51	1			1468-000001	TCZ-1		NP0K-010		Sound IF Coupling
C52	33			SI33	D6-330		GP1K-330	5GA-Q33	Sound IF Coupling
C53	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Decoupling
C54	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	Sound IF Cathode
C55	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	RF Bypass

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C56	1000			SII000	D6-102	TM5D1	GP2L-102	5HK-D1	Diode Load Cap.
C57	47			SI47	D6-470	TM5Q5	GP1K-470	5GA-Q47	RF Bypass
C58	2200	500		SI2200	D6-222	1W5D25	GP2-333-222	5HK-D22	De-Emphasis
C59	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C60	100	500		1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	AF Amp. Plate Bypass
C61	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C62	4700	500		1467-005	D6-472	1D5D5	GP2-333-472	1FM-25	Audio Output Plate
C63	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Decoupling
C64	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync. Coupling
C65	.25	200		P488-25		PJ2P25		2TM-P25	Sync. Sep. Cathode
C66	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync. Coupling
C67A	.0022			P688-0022		PTE6D22	GP2-333-202		Vert. Integrator Net.
B	.0047			P688-0047	♦PC-100	PTE6D47	GP2-333-472	♦101C1	Vert. Integrator Net.
C	.0047			P688-0047		PTE6D47	GP2-333-472		Vert. Integrator Net.
C68	4700	500		1464-005		1DR5D5		MS-25	Vert. Osc. Grid Cap.
C69	.1	600		P688-1		PTE6P1		6TM-P1	Vert. Discharge
C70	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Vert. Sweep Coupling
C71	.25	600		684-25		PTE6P25		6TM-P25	Vert. Sweep Coupling
C72	2200	500		1467-0025	D6-221	1W5D25	GP2-333-222	5HK-D22	Horiz. Sync. Coupling
C73	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Voltage Divider
C74	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Horiz. Feedback
C75	1500	500		1467-0015	D6-152	1W5D15	GP2L-152	1FM-215	Voltage Divider †
C76	680	500		1479-0007	D6-681	2R5T7	GP2K-681	MS-37	Horiz. AFC Filter
C77	.25	200		P488-25		PJ2P25		2TM-P25	Horiz. AFC Filter
C78	.02	600		P688-02	DF-203	PTE6S2		6TM-D2	Horiz. AFC Filter
C79	3900	500		1464-004		1DR5D4			Fixed Trimmer
C80	390	500		1469-0004		5R5T4		MS-34	Horiz. MV Feedback
C81	680	500		1479-0007		2R5T7		MS-37	Horiz. Discharge
C82	500	500		1468-0005	D6-501	5W5T1	GP2K-501	1FM-35	Horiz. Sweep Coupling ¶
C83	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Output Screen
C84	.1	200		P288-1		PJ2P1		2TM-P1	Damper Filter
C85	.03	200		P488-03		PTE6S3		6TM-S3	Damper Filter
C86	.25	600		684-25		PTE6P25		6TM-P25	RF bypass
C87	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sweep Coupling
C88	220	500		1469-00025		5R5T25			Fixed Trimmer
C89	47	1500							Fixed Trimmer
C90	500	15000		HV20A	TV1-502	MM-A20T5	410-501	510C1	HV Filter
C91	500	15000		HV20A	TV1-502	MM-A20T5	410-501	510C1	HV Filter *
C92	.01	600		P688-01		PTE6S1		6TM-S1	Focus Filter
C93	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	Line Filter
C94	5000			BPD-005	DD-502	TM5D5	811-005	5HK-D5	Line Filter

† Some models use .33MMF in this application.
‡ Some models use 2200MMF in this application.
¶ Some models use 470MMF in this application.
* Not used when picture tube has outer conductive coating.
♦ Items C67A, C67B, C67C, R70A, R70B, R70C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	1000Ω	2	TV-VC-36		RTV-292		Contrast Control - Wire Wound - Panel
B	250KΩ	½					Volume Control & SW - Rear
R2A	2.5Meg	½	TV-VC-28	QII-239	AG-84-S	AN-83	Height Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	1Meg	½	TV-VC-30	QII-137	AG-61-S	AN-69	Vert. Hold Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R3A per instructions
R4A	100KΩ	½	TV-VC-32	QII-128	AG-49-S	AN-40	Brightness Control
B	Shaft		Not Req.	Not Req.	FKS -1/4	AK-1	Attach to R4A per instructions
R5A	50KΩ	½	TV-VC-31	QII-123	AG-44-S	AN-31	Horiz. Hold Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	100KΩ	½	TV-VC-32	QII-128	AG-49-S	AN-40	Picture Contrast Range Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	2.5Meg	½	TV-VC-28	QII-239	AG-84-S	AN-83	Focus Control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R7A per instructions
R8	5000Ω	2	TV-VC-29	W-5000	43-5000	VK-135	Vert. Linearity Control - Wire Wound

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R9	1800Ω	½		BTS-1800	Antenna Coil Shunt
R10	10KΩ	20% 1			RF Amp. Grid
R11	10KΩ	20% 1			RF Amp. Screen
R12	1000Ω	½		BTS-1000	RF Amp. Plate Decoupling
R13	2200Ω	½		BTS-2200	RF Coil Shunt
R14	6800Ω	½			Mixer Coil Shunt
R15	12KΩ	20% ½			Mixer Grid
R16	470KΩ	20% ½			Mixer Grid
R17	10KΩ	20% ½			Mixer Plate Decoupling
R18	10KΩ	20% ½			Osc. Plate Decoupling
R19	4700Ω	20% ½		BTS-4700	Osc. Grid
R20	100KΩ	½		BTS-100K	AGC Network
R21	8200Ω	½			1st. Video IF Amp. Grid
R22	47Ω	½			1st. Video IF Amp. Cathode
R23	100Ω	20% ½		BTS-100	1st. Video IF Amp. Decoupling
R24	100KΩ	½		BTS-100K	AGC Network
R25	22KΩ	½			2nd. Video IF Amp. Grid
R26	47Ω	½			2nd. Video IF Amp. Cathode
R27	100Ω	20% ½		BTS-100	2nd. Video IF Amp. Decoupling
R28	100KΩ	½		BTS-100K	AGC Network
R29	20KΩ	½			3rd. Video IF Amp. Grid
R30	220Ω	½		BTS-220	3rd. Video IF Amp. Cathode - See Note 1
R31	1000Ω	20% ½		BTS-1000	3rd. Video IF Amp. Decoupling
R32	680KΩ	20% ½		BTS-680K	AGC Rectifier Diode Load
R33	1Meg	20% ½		BTS-1Meg	AGC Network
R34	15KΩ	10		1 3/4A-15K	Voltage Divider - Wire Wound
R35	4700Ω	½		BTS-4700	AGC Rectifier Cathode
R36	8200Ω	½		BTS-8200	Video Det. Diode Load

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R37	470KΩ	20% ½		BTS-470K	Video Output Grid
R38	68Ω	½			Video Output Cathode
R39	2200Ω	½		BTS-2200	Video Output Cathode
R40	2200Ω	2		BTS-2200	Video Output Screen
R41	18KΩ	1		BTA-18K	Video Output Screen Decoupling
R42	18KΩ	1		BTA-18K	Video Output Screen Decoupling
R43	6800Ω	5		1 3/4A-7000	Video Output Plate - Wire Wound
R44	47KΩ	½		BTS-47K	Isolation
R45	68KΩ	½		BTS-68K	Picture Tube Cathode
R46	330KΩ	½		BTS-330K	Voltage Divider
R47	220KΩ	½		BTS-220K	Voltage Divider
R48	47KΩ	20% ½		BTS-47K	Voltage Divider
R49	100KΩ	½		BTS-100K	Voltage Divider
R50	330KΩ	½		BTS-3.0K	Picture Tube Grid
R51	68KΩ	½			Sound IF Amp. Grid
R52	68Ω	½			Sound IF Amp. Cathode
R53	12KΩ	2			Sound IF Amp. Decoupling
R54	470Ω	½		BTS-470	Balancing
R55	33KΩ	20% ½		BTS-33K	De-emphasis
R56	6800Ω	½		BTS-6800	Ratio Det. Diode Load
R57	6800Ω	½		BTS-6800	Ratio Det. Diode Load
R58	12KΩ	½		BTS-12K	AF Amp. Cathode
R59	470KΩ	20% ½		BTS-470K	AF Amp. Plate
R60	470KΩ	20% ½		BTS-470K	Output Grid
R61	390Ω	1		BTA-390	Output Cathode
R62	390Ω	1		BTA-390	Output Decoupling
R63	100Ω	½		BTS-100	Decoupling
R64	4.7Meg	20% ½		BTS-4.7Meg	Sync. Seperator Grid
R65	330KΩ	½		BTS-330K	Sync. Seperator Cathode
R66	47KΩ	½		BTS-47K	Sync. Seperator Plate
R67	1Meg	20% ½		BTS-1Meg	Sync. Phase Inverter Grid
R68	2700Ω	2		BTS-2700	Sync. Phase Inverter Cathode
R69	8200Ω	½		BTS-8200	Sync. Phase Inverter Plate
R70A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½		BTS-8200	Integrator Network ♦
C	8200Ω	½		BTS-8200	Integrator Network
R71	2200Ω	½		BTS-2200	Vert. Peaking
R72	1000Ω	20% ½		BTS-1000	Vert. Blanking Network
R73	1Meg	20% ½		BTS-1Meg	Vert. Osc. Grid
R74	1Meg	20% ½		BTS-1Meg	Vert. Output Grid
R75	390Ω	1		BTA-390	Vert. Output Cathode
R76	220KΩ	½		BTS-220K	Vert. Osc. Plate
R77	33KΩ	20% ½		BTS-33K	Horiz. Feedback
R78	6800Ω	1		BTA-6800	Horiz. Feedback
R79	100KΩ	½		BTS-100K	Horiz. Phase Det. Load
R80	100KΩ	½		BTS-100K	Horiz. Phase Det. Load
R81	100KΩ	½		BTS-100K	Horiz. AFC Filter
R82	33KΩ	½		BTS-33K	Horiz. AFC Filter
R83	1500Ω	½		BTS-1500	Horiz. MV Cathode
R84	5600Ω	5% ½		BTS-5600 5%	Horiz. MV Plate
R85	8200Ω	½		BTS-8200	Horiz. MV Plate
R86	150KΩ	20% ½		BTS-150K	Horiz. MV Plate
R87	100KΩ	½		BTS-100K	Horiz. MV Grid
R88	1Meg	20% ½		BTS-1Meg	Horiz. Output Grid
R89	33KΩ	20% 2		BTB-33K	Horiz. Output Screen
R90	100Ω	20% ½			Parasitic Suppressor
R91	1000Ω	1		BTA-1000	Horiz. Linearity Coil Shunt
R92	10KΩ	½		BTS-10K	Damping
R93	10KΩ	1		BTA-10K	Damping
R94	3Ω	½			HV Rectifier Filament
R95	1Meg	20% 1			HV Filter
R96	220KΩ	½		BTS-220K	Voltage Divider
R97	210Ω	5		1 3/4A-200	Filter - Wire Wound
R98	100Ω	20% ½		BTS-100	Filament Shunt
R99	22KΩ	½		BTS-22K	Horiz. Hold Control Shunt

Note 1. Some Models use a 1000Ω Resistor in this application
♦ Items R70A, R70B, R70C, C67A, C67B, C67C, are combined in one unit

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @1.8A	720VCT .165ADC	5VAC @3A	6.3VAC @6.5A			P-3174	
			SEC. 4	SEC. 5				
			6.3VAC @.7A	6.3VAC @1.2A				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: TRAV-LER PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	180Ω	1100Ω	TV-TR-3	A-8122	A-4003	TB0-2	Vert. Oscillator Trans.
T3	270Ω Tapped @10Ω	12.5Ω Tapped @.7Ω					Horiz. Output Trans.
	SEC. 2	SEC. 3					
	1.3Ω	0Ω					
T4	1400Ω Tapped @10Ω		TV-TR-8	A-8123	A-3037	TS0-5 ①	Vert. Output Trans.
T5A	13Ω		TVL-40	DY-8	MDF-70		Horiz. Deflection Coils
T B	45Ω						Vert. Deflection Coils

① Drill one new mounting hole

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T6	7KΩ	3.3Ω	450Ω	.6Ω		A-3878 ②	A-2931 ②	RO-13 ②	② Bend Mounting Tabs Down, File out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	TRAV-LER PART No.	VIKING PART No.	QUAM PART No.	
SP1A	P.M.	3.3Ω	SPK-18	46J6	46A1	
	CONE DIA.	V. C. DIA.				
SP1B	4" x 6"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ↺)	TRAV-LER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.165ADC	58Ω	2 Hy.	TV-FC-1	C-2325 ①	C-2974	TR-4200①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TRAV-LER PART No.	MERIT PART No.	
L2	Ant. Trans.	1Ω	1Ω			
L3	Ant. Trans.	1Ω	1Ω			
L4	RF Choke	.1Ω				Wound on 82MMF Cap.
L5	Ant. Coils	0Ω				
L6	RF Coils	0Ω				
L7	Mixer Grid Coils	0Ω				
L8	Osc. Coil	0Ω				Channel 6
L9	Osc. Coil	0Ω				Channel 13
L10	Osc. Coils	0Ω				
L11	Fil. Choke	.1Ω				
L12	Conv. Plate	.4Ω	.1Ω			
L13	1st. Video IF	0Ω	.5Ω			
L14	Fil. Choke	0Ω				
L15	2nd. Video IF	.3Ω			TV-112	
L16	Fil. Choke	0Ω				
L17	3rd. Video IF	.3Ω			TV-112	
L18	Fil. Choke	0Ω				
L19	4th. Video IF	.3Ω			TV-112	
L20	Cath. Choke	3.2Ω				
L21	Peaking Coil	3.6Ω			TV-181	
L22	Peaking Coil	5.5Ω			♦TV-186	Wound on 10K resistor
L23	Peaking Coil	12.5Ω			BC-501	
L24	4.5MC Trap	1.6Ω			TV-151	
L25	Sound IF	1.6Ω			TV-151	
L26	Ratio Det.	4.2Ω	2Ω		*TV-110	Tap @ 1.8Ω
L27	Horiz. Osc.	80Ω			TV-163	
L28	Width Coil	5.3Ω			MWC-2	
L29	Horiz. Lin.	4Ω				Tap @ 3Ω

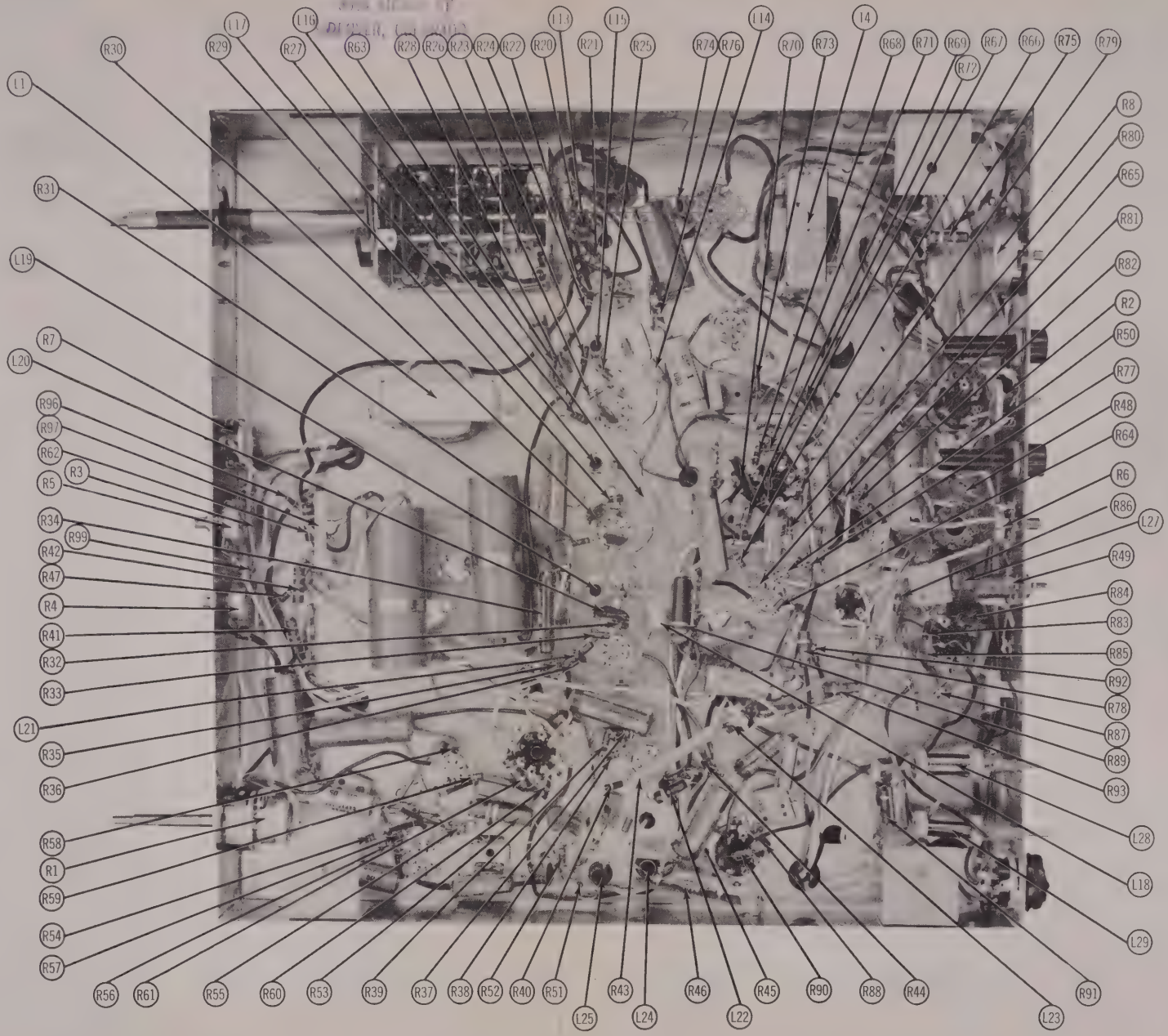
* Drill two mtg. holes.
♦ Parallel with 10K resistor.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRAV-LER PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Slo-Blo	2A. 125V.			313002	341001	MDL2	HKP
M2	3AG Slo-Blo	1/4A. 125V.			313.250	341001	MDL 1/4	HKP

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M3	RF Tuner		
M4	Centering Magnet		
M5	Ion Trap		
A14	Trimmer	66-11097-1	IF Coupling Link (25-280MMF)
B2	Trimmer	TV-TC-11	Horiz. Drive

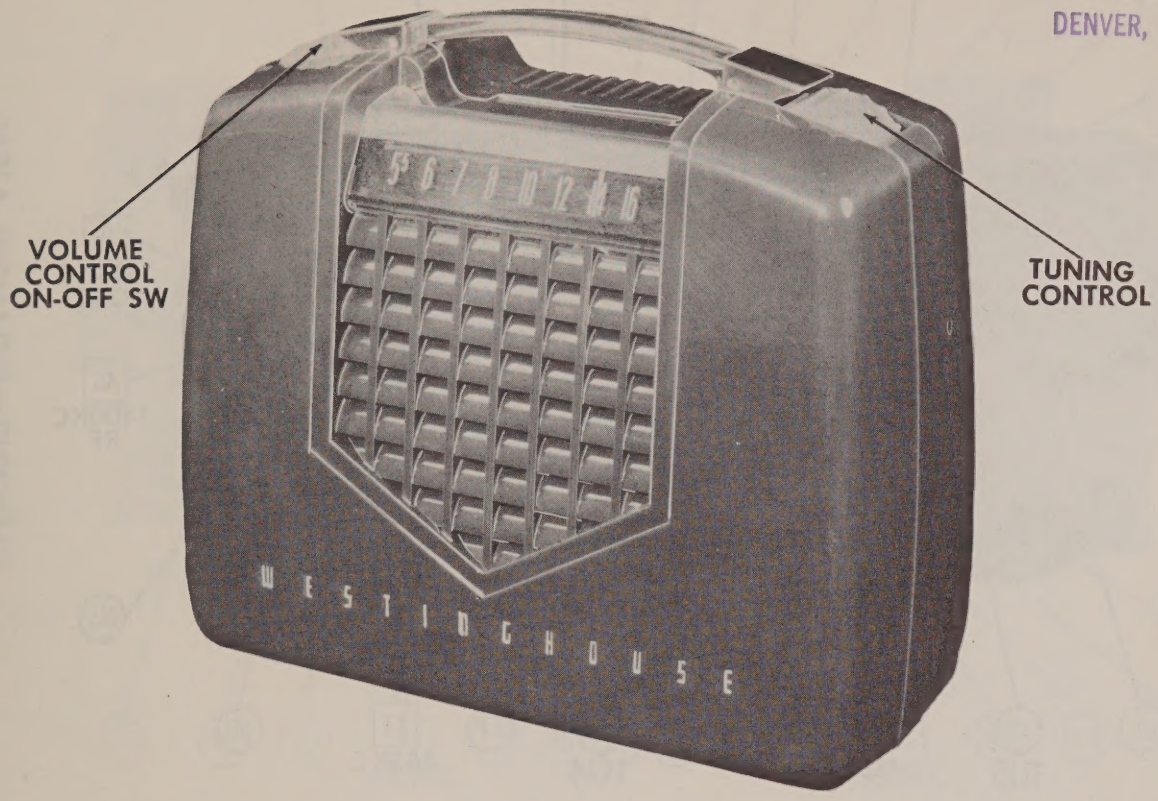


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

WESTINGHOUSE
MODELS H-331P4U, H-333P4U (Ch. V-2164U)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE
MODELS H-331P4U, H-333P4U (Ch. V-2164U)



WESTINGHOUSE
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WESTINGHOUSE MODEL H-333P4U

TRADE NAME	Westinghouse Models H-331P4U, H-333P4U (Ch. V-2164U)
MANUFACTURER	Westinghouse Elect. Corp., TV-Radio Div., Sunbury, Pa.
TYPE SET	Three Power Portable Superheterodyne Receiver With Loop Antenna
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det. -AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC/DC or 4.5 Volts "A" Supply and 90 Volts "B" Supply
RATING	.12 Amp. @ 117 Volts AC or 50 MA @ 4.5 Volts DC and 14MA @ 90 Volts DC
TUNING RANGE—BROADCAST	540-1615KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully closed and set pointer 15/16 inch to the left of right hand end of dial background material.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across Voice Coil.	A1, A2, A3, A4	Adjust for Maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1615KC	Tuning gang fully open	Across Voice Coil	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output	Across Voice Coil	A6	"

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PARTS LIST AND DESCRIPTIONS

WESTINGHOUSE MODEL H-331P4U

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WESTINGHOUSE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det. -AVC -AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WESTINGHOUSE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	150	V-6552-2	E4D250		UP44415C10		R1105	▲Filter
B	40	150				BR6015			▲Filter
C	80	150							■Decoupling
D	100	25							Fil. Filter
C2	.05	200	RCP10W2503M	P288-05	DF-503	PJ255		2TM-S5	AVC Filter
C3	10000		V-9863-3	BPD-01	DD-103	TM5S1	821-01	5HK-S1	Osc. Anode Bypass
C4	.1	200	RCP10W2104M	P288-1	DF-104	PJ2P1		2TM-P1	Conv. Fil. Bypass
C5	.1	200	RCP10W2104M	P288-1	DF-104	PJ2P1		2TM-P1	IF Amp. Fil. Bypass
C6A	150			S1150	D6-151	TM5T15	GP2K-151		Diode RF Filter
B	.002			BPD-002	DD-202	TM5D2	801-002		Audio Coupling
C	.005			BPD-005	DD-502	TM5D5	811-005	34C4	AF Amp. Screen Bypass
D	100			S1100	D6-101	TM5T1	GP1K-101		AF Amp. Plate Bypass
E	.005			BPD-005	DD-502	TM5D5	811-005		Audio Coupling
C7	2000		V-9863-2	BPD-002	DD-202	TM502	801-002	5HK-D2	Audio Output Plate
C8	.047	400	V-10157-4473M	489ZGXY		PJ4S5		4TM-S47	Line Filter
C9	.05	200	RCP10W2503M	P288-05	DF-503	PJ2S5		2TM-S5	Line Isolation

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WESTINGHOUSE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART NO:	INSTALLATION NOTES
R1A	500KΩ	½	V-9993-3	Q13-133	AG-60-Z	BSK-60-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions.
C	Switch		Not Req.	76-2	SWB-2	Not Req.	Attach to R1A per instructions.

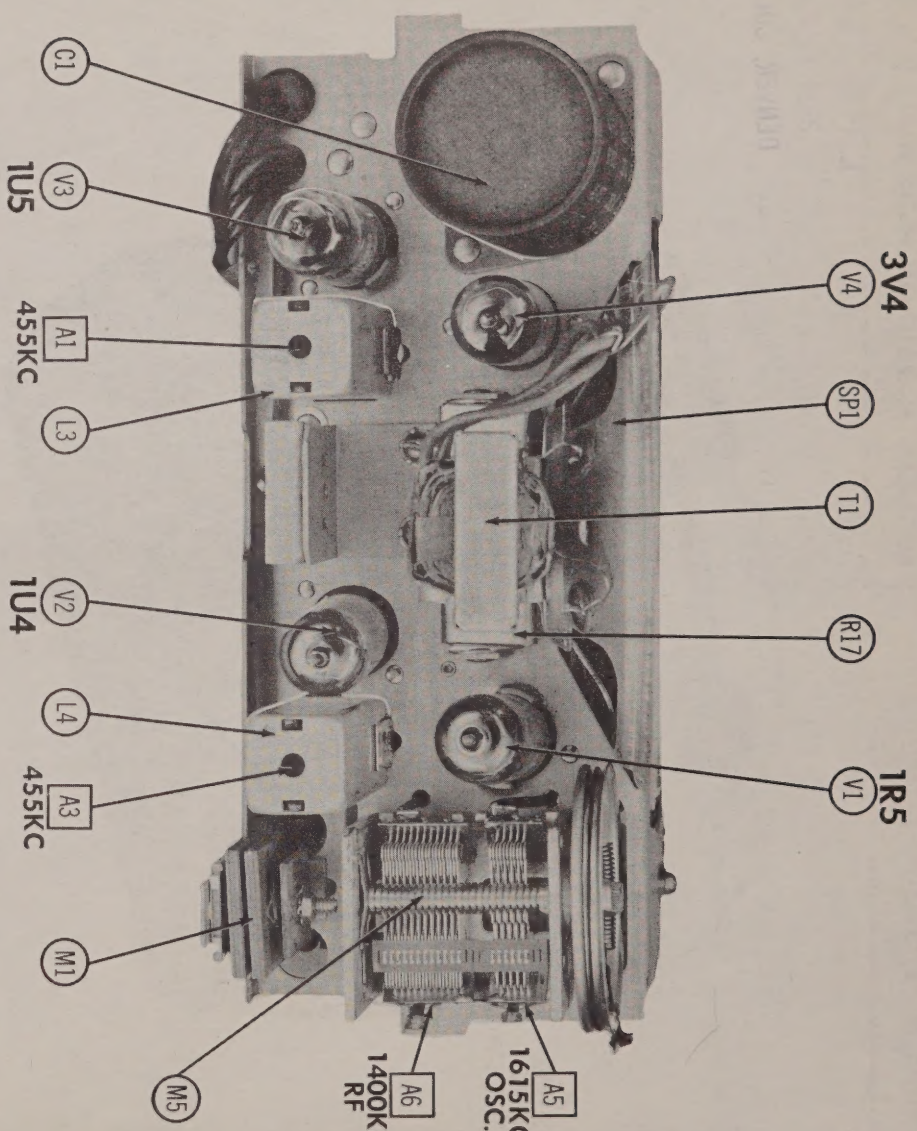
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WESTINGHOUSE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	100KΩ	½	RC20AE104M		Osc. Grid
R3	6800Ω	½	RC20AE682M	BTS-6800	Osc. Anode
R4	470KΩ	½	RC20AE474M	BTS-470K	Bias Network
R5	82KΩ	½	RC20AE823K	BTS-82K	Bias Network
R6	3.3 Meg	½	RC20AE335M	BTS-3.3 Meg	AVC Network
R7	47KΩ	½	RC20AE473M	BTS-47K	Diode Filter
R8	10 Meg	½	RC20AE106M	BTS-10 Meg	AF Amp Grid
R9	4.7 Meg	½	RC20AE475M	BTS-4.7 Meg	AF Amp Screen
R10	1 Meg	½	RC20AE105M	BTS-1 Meg	AF Amp Plate
R11	1 Meg	½	RC20AE105M	BTS-1 Meg	Output Grid
R12	150 Ω	4	V-6067-8		Surge Limiter-wire wound
R13	1000Ω	½	RC20AE102M	BTS-1000	Filament String
R14	820Ω	½	RC20AE821K	BTS-820	Filament String
R15	1500Ω	½	RC20AE152K	BTS-1500	Filament String
R16	27Ω	½	RC20AE270K		Filament String
R17A	1000Ω	5	V-10435-2		Filament Dropping-wire wound
B	1000Ω	5			Filter - wire wound
R18	470Ω	½	RC20AE471K	BTS-470	Filter
R19	82Ω	½	RC20AE820K	BTS-82	Voltage Divider

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: WESTINGHOUSE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	9KΩ	3.3Ω	360Ω	.35Ω	Part of V-10401-1	A-3329①	A-2927①		① Bend Mounting Tabs Down, File Out Slots and Mount on Original Bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	WESTINGHOUSE PART No.	VIKING PART No.	QUAM PART No.	
SP1A	P. M.	3.3Ω	V-10401-1	4J4	4A07	
	CONE DIA.	V. C. DIA.				
SP1B	4"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	WESTINGHOUSE PART No.	MERIT PART No.	
L1	Loop Ant.	0Ω	.2Ω	V-10921-1		
L2	Osc. Coil	2.6Ω	11.5Ω	V-5661-2	BC-381 *	* Drill One Mtg. Hole.
L3	Input IF	17.5Ω	17Ω	V-6972-5	BC-352	
L4	Output IF	23Ω	23Ω	V-6972-6	BC-353	

SELENIUM RECTIFIER

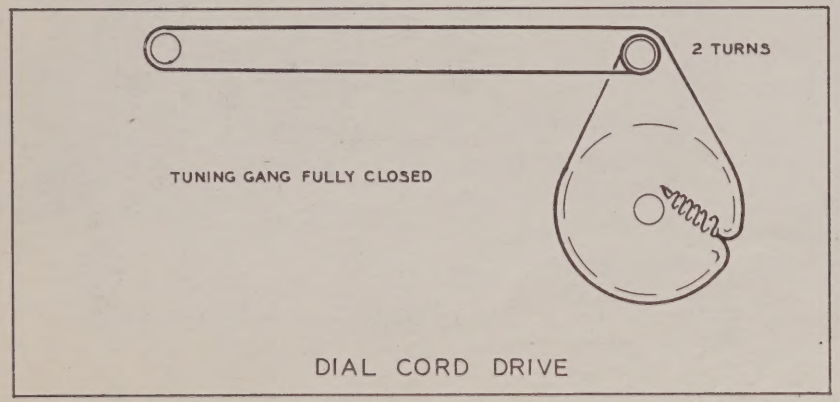
ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT	WESTINGHOUSE PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	
M1	.063A. DC	V-9446-2	NB-5	5M4	1003A	

BATTERIES

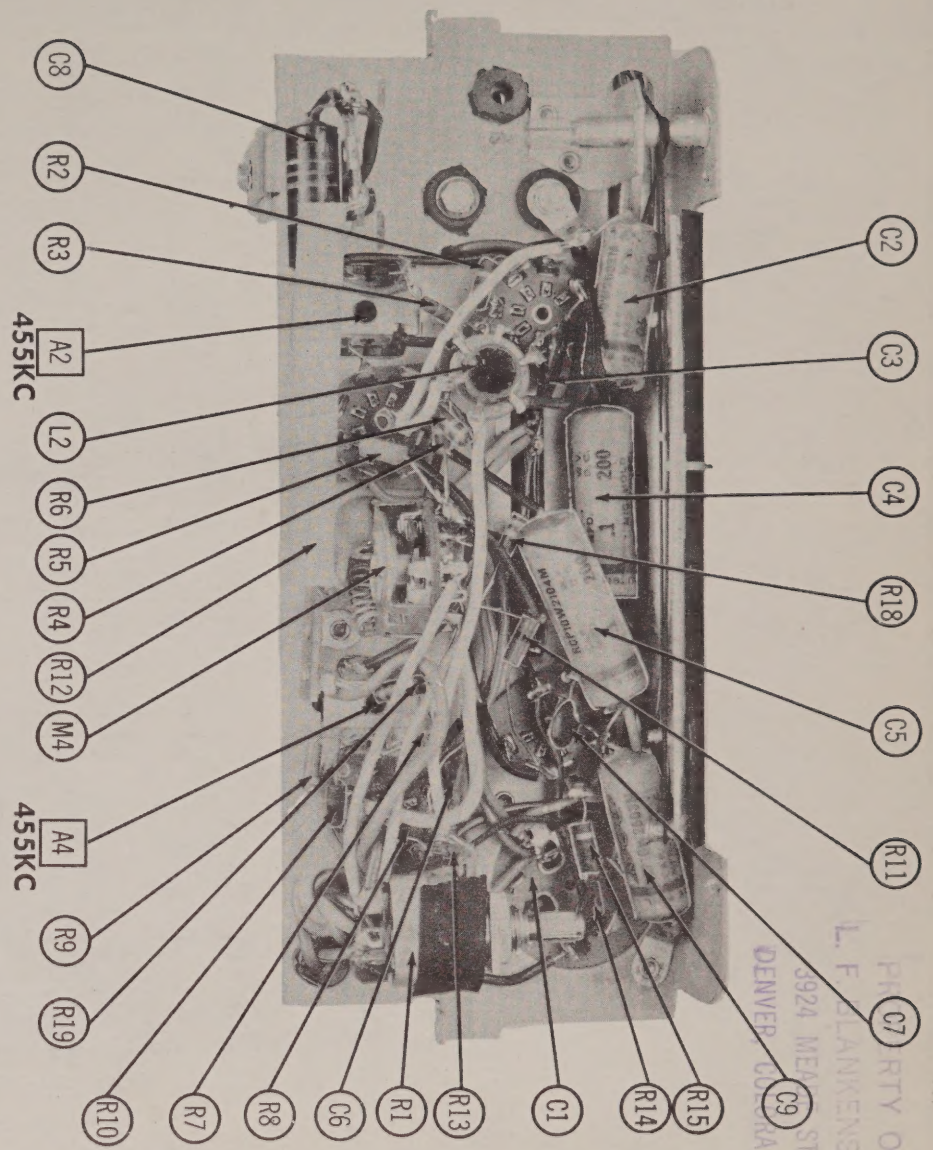
ITEM No.	VOLTAGE	WESTINGHOUSE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	4.5V		736			F3			
M3	90V			490			N60		

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M4	Switch	V-10426-1	Power Change-over
M5	2 Gang Var. Cap	V-10417-1	(25-332MMF, 14-157MMF)
	Cabinet	V-1234-2	H-331P4U (Green)
	Cabinet	V-1234-3	H-333P4U (Brown)
	Pointer	V-10422-2	
	Knob	V-10420-1	H-331P4U
	Knob	V-10420-2	H-333P4U
	Handle	V-10438-1	



CHASSIS—BOTTOM VIEW



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SET 171 FOLDER 12

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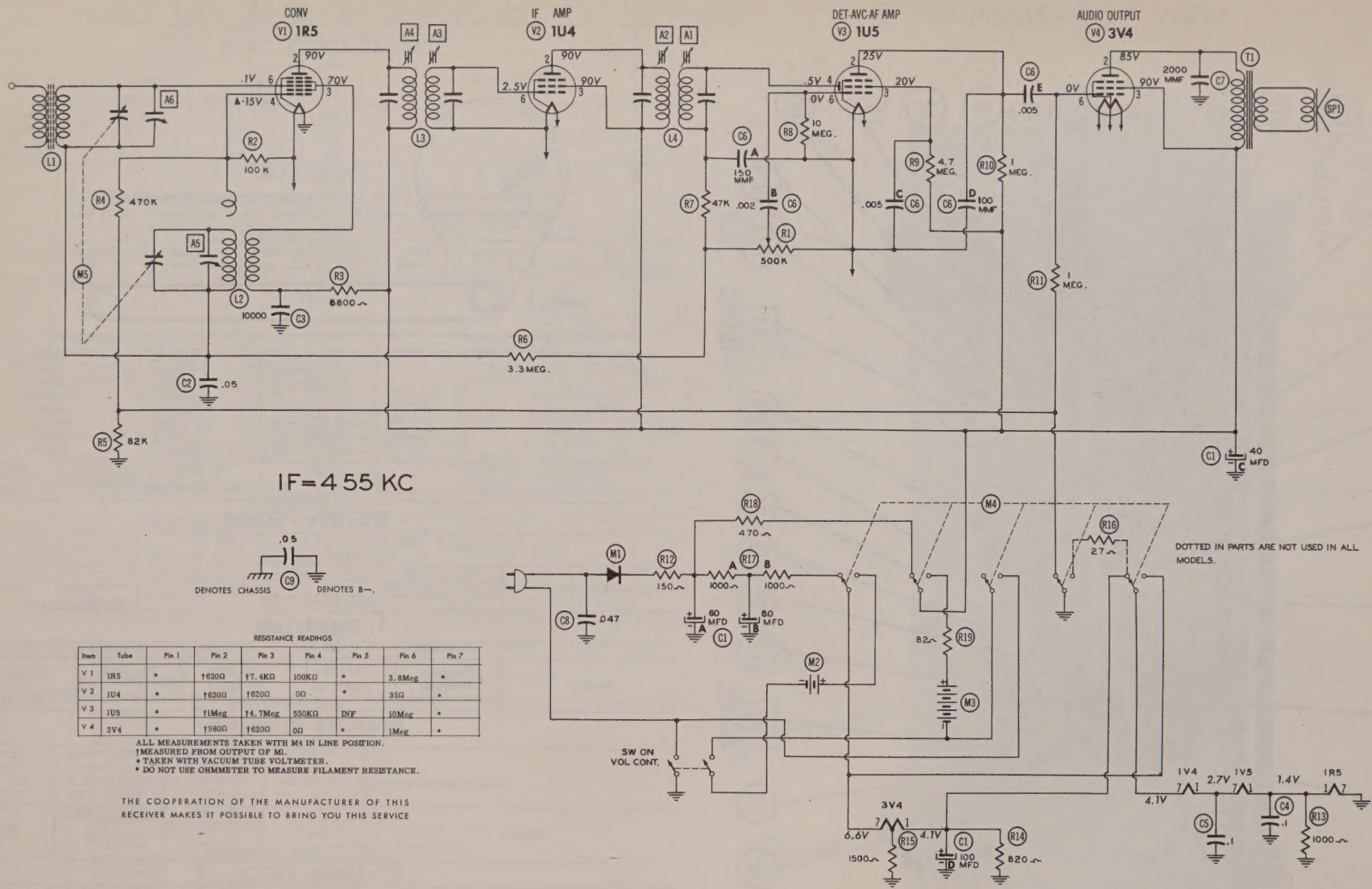

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†620Ω	†7.4KΩ	100KΩ	*	3.8Meg	*
V 2	1U4	*	†620Ω	†620Ω	0Ω	*	35Ω	*
V 3	1U5	*	†1Meg	†4.7Meg	550KΩ	INF	10Meg	*
V 4	3V4	*	†980Ω	†620Ω	0Ω	*	1Meg	*

ALL MEASUREMENTS TAKEN WITH M4 IN LINE POSITION.
†MEASURED FROM OUTPUT OF M1.
♦ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.